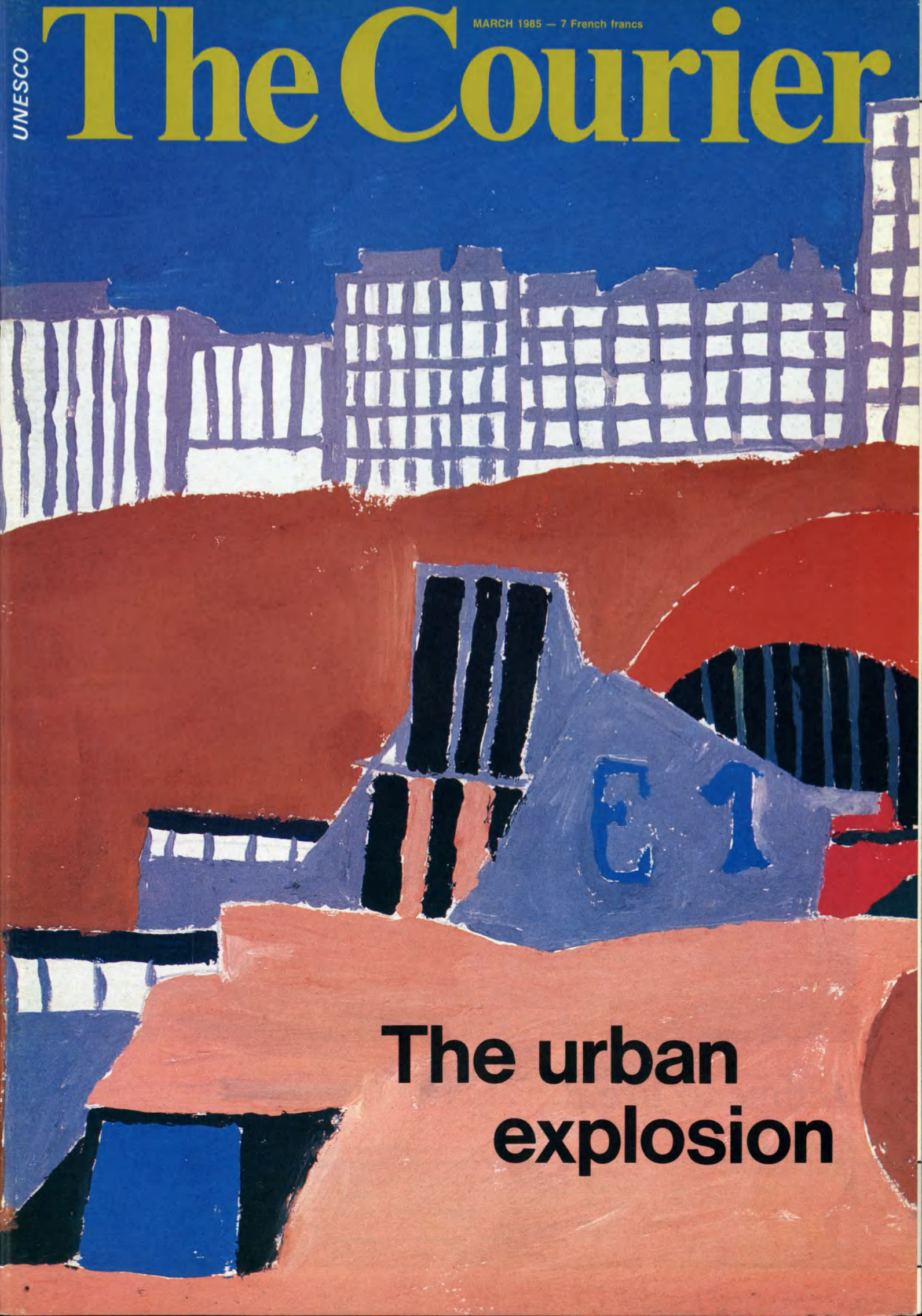
UNESCO

# The Courier

MARCH 1985 — 7 French francs



## The urban explosion

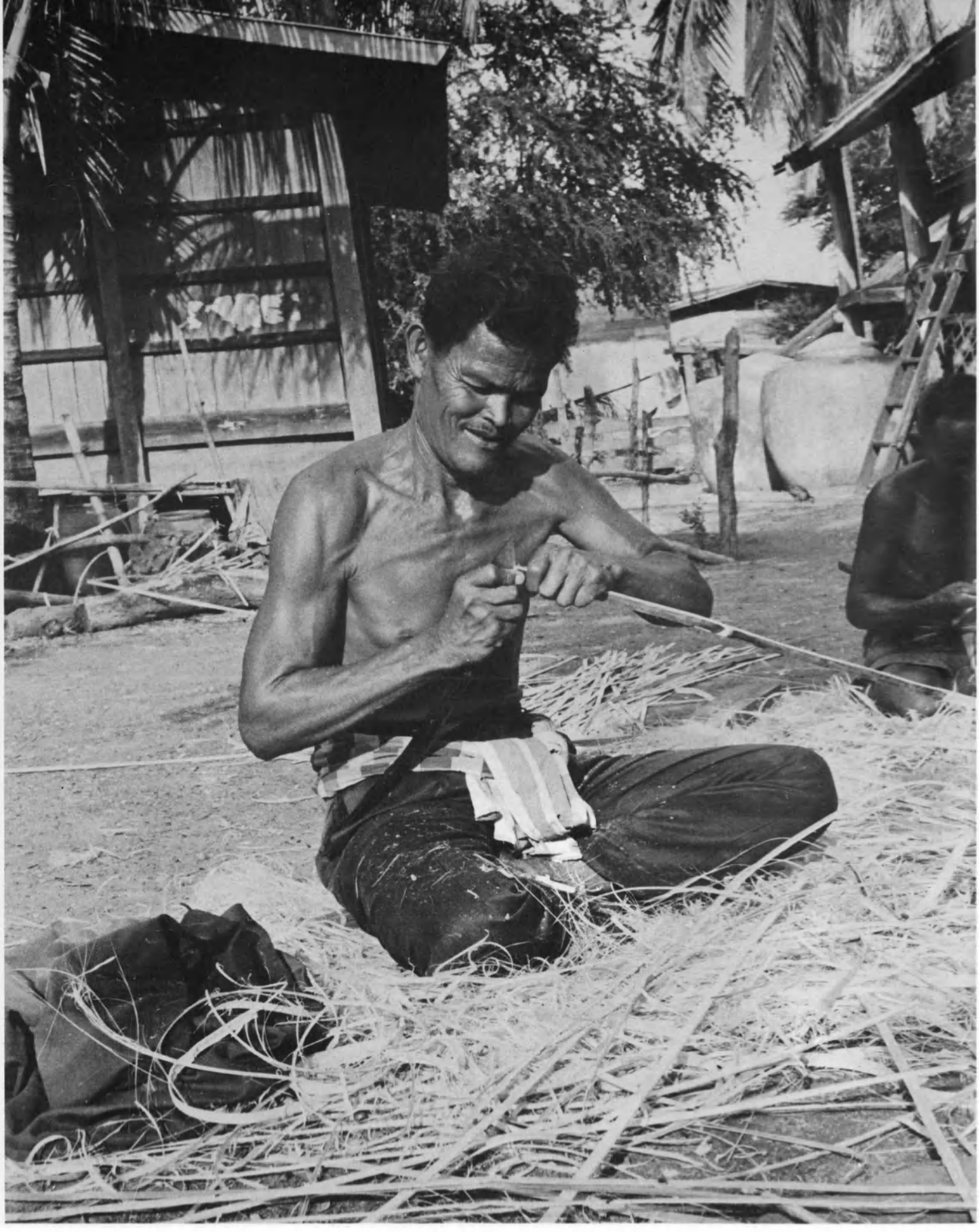


Photo Unesco Regional Office for Education in Asia and the Pacific, Bangkok

# A time to live...

## 32 Thailand

**"Barefoot" architects**

Patterned on the successful Chinese system of "barefoot" doctors (local people trained to provide a basic level of health services in remote rural areas), schemes are now being elaborated, with Unesco support, for the training of "barefoot" architects who would be able to help solve the major problems of villages or marginal urban settlements. In Thailand the "barefoot" architects of Baan Nong Pai ("Bamboo village") have adapted techniques traditionally used in basket weaving to create patterned walls and shutters for a preschool child-care centre.

UNESCO
# The Courier
A window open on the world

## Editorial

THIS issue of the *Unesco Courier* is concerned with a crucial world problem: the extraordinary phenomenon of urbanization today and its far-reaching implications for tomorrow.

By the year 2000 half the people on Earth will be living in cities facing acute problems of housing, transport, food and water supply, schooling, sanitation and security. The lion's share of urban growth is taking place in the developing countries whose drama of rampant urbanization dwarfs the problems of urban stagnation and inner city decay encountered in the industrialized world. With their services already overburdened by their present populations, Third World cities exercise a magnetic attraction on the people of their surrounding rural areas, luring a massive influx of migrants for whom the bitter reality is not streets paved with gold but a desperate struggle for survival in slums and shantytowns. Our article "The World's Urban Explosion", in which these and other aspects of the crisis of the world's cities are evoked, is based on the report of an international symposium held in Paris in October 1984 and attended by more than 800 people from 70 cities.

Awareness of the consequences of rapid population growth and urbanization has grown considerably since the United Nations World Population Conference held in Bucharest in 1974. Last year, in Mexico City, a second International Conference on Population was convened by the United Nations to review and appraise the World Population Plan of Action adopted at Bucharest. As part of its input to the Mexico City Conference Unesco prepared a study, *Unesco, Population and Development,* from which we publish salient extracts.

Almost one third of this issue is devoted to a presentation of the prizewinning projects in a Unesco World Competition for Young Architects on the theme of "Tomorrow's Habitat", organized on the occasion of International Youth Year 1985. The projects are being exhibited at the International Exhibition in Tsukuba, Japan, from 17 March to 16 September this year. The Chairman of the Jury for the Competition was Kenzo Tange and our presentation of the prizewinning projects is prefaced by an article in which this celebrated Japanese architect and city planner looks back over almost half a century on the ideas and theories that have shaped his work.

Two more of this month's contributors are internationally renowned architects: Oscar Niemeyer, the designer of the principal buildings of Brasilia, Brazil's capital, whose conception of a city for the year 2000 attaches due importance to the role of culture, recreation and leisure in urban life; and Hassan Fathy of Egypt who outlines a plan for Cairo tomorrow.

Finally, Jean Dethier, a Belgian architect specializing in the use of unbaked earth, examines a possible solution to housing problems opened up by the modernization of traditional methods of building with this readily available material.

**Editor-in-Chief:** Edouard Glissant

*March 1985*
38th year

Photo Unesco/Jean-Claude Bernath

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**Cover:** detail of a picture by a Spanish boy, Tómas Pérez de la Partilla. The work was among those commended in an international children's art contest organized in 1979 on the occasion of the International Year of the Child (see back cover caption).
Photo Unesco/Jean-Claude Bernath

Published monthly in **31 languages** by Unesco,
The United Nations Educational, Scientific and Cultural Organization
7, Place de Fontenoy, 75700 Paris.

**English** **French** **Spanish** **Russian** **German** **Arabic** **Japanese**
**Italian** **Hindi** **Tamil** **Hebrew** **Persian** **Dutch** **Portuguese**
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A selection in Braille is published quarterly in English, French, Spanish and Korean

ISSN 0041-5278
N° 3 - 1985 - OPI - 85 - 1 - 420 A

# Tomorrow's habitat

## An international competition for young architects

AS part of its activities to mark International Youth Year, Unesco, in collaboration with the International Union of Architects, has organized a world competition for young architects on the theme "Tomorrow's Habitat". Seventy-two countries announced that they would participate in the competition and would organize a national competition to select five projects from among works submitted by students of architecture and young architects under the age of thirty-five.

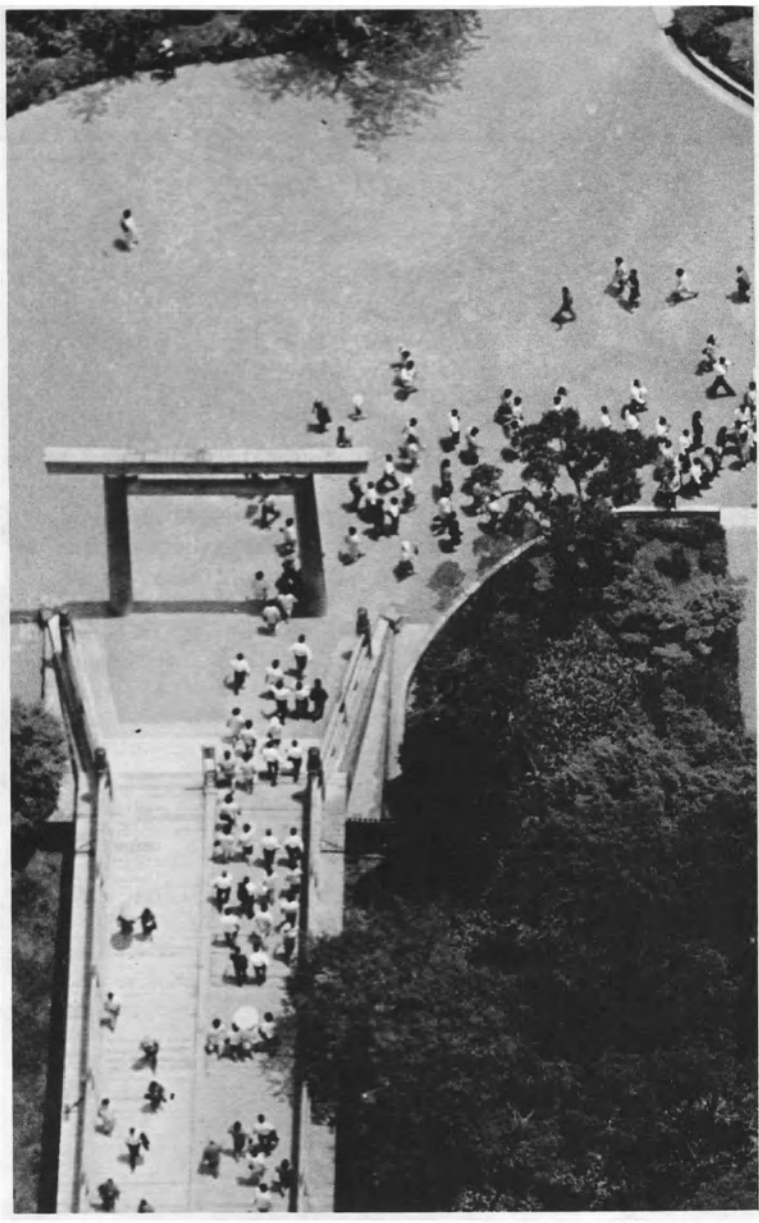
Entrants were required to submit a project on two boards, each measuring 700 mm by 1,000 mm, showing their design for a model dwelling set in the socio-cultural context of their country, in harmony with their environment and taking into account the most appropriate scientific and technological advances.

In May 1984 an eight-member international jury met at Unesco Headquarters in Paris to choose ten prizewinning entries from among those selected in the national competitions. According to the terms of the competition, the winning projects were to be built in model form and exhibited in the "World Peace Pavilion—The United Nations Family" at the international exhibition being held at Tsukuba, Japan, from 17 March to 16 September 1985. The main theme of the exhibition is "Dwellings and Surroundings—Science and Technology for man at home". With the co-operation of Japan Airlines, a two-week trip to Tokyo and "Tsukuba Expo.85" was awarded by Unesco to the ten prizewinners. (In the case of a group project, the team is to select its representative for the trip).

In its assessment of the entries, the Jury noted that "The whole concept of the future and the notion of 'tomorrow' differ from one socio-cultural context to another... Many architects admit that it is difficult even to design contemporary housing fully consonant with the needs and aspirations of today's men and women. Moreover, it has to be borne in mind that tomorrow's habitat is being built today, using the theoretical and technical knowledge of our time, and that in many countries such a habitat can only be created by adapting a greater or lesser proportion of the existing stock of buildings.

"The many projects submitted... reveal that the different countries are motivated by a great variety of concerns. Apart from the purely Utopian or dream-world projects, there are a large number of entries that show some degree of realism and demonstrate that young architects are concerned not only with the way their project fits into its environment but also with how it fits in with society. Furthermore, many projects indicate that the training of architects has undergone extreme diversification over the past few years and that many schools in developing countries are now showing a great deal of intellectual independence and a complete awareness of the specific features of the socio-cultural context in the country or region in which their graduates will have to work."

The prizewinning projects are presented from page 8 to page 17. They are preceded by a text, beginning this page, in which the president of the jury, Kenzo Tange, describes his conception of architecture and urbanism. Quotations in captions accompanying the projects are from texts written by the entrants themselves. ■



# Architecture

*by Kenzo Tange*

WHEN I graduated from university in 1938, modern architecture was already a prey to the snares of formalism. The modern movement, which styled itself rationalism or functionalism, had rejected all past traditions and styles and was dominated by the idea that the "white box" (which is actually only a starting point) was the ultimate goal. All negation of the past was willingly integrated. I could not help but think that this kind of contemporary architecture had already lost its vital force. At that time I was strongly influenced by Le Corbusier, who seemed to me to stand alone in setting his work on the level of architectural art.

I was also strongly attracted by Renaissance architecture and by Michelangelo.

Study of Michelangelo enabled me to understand the grandeur of ancient Greece

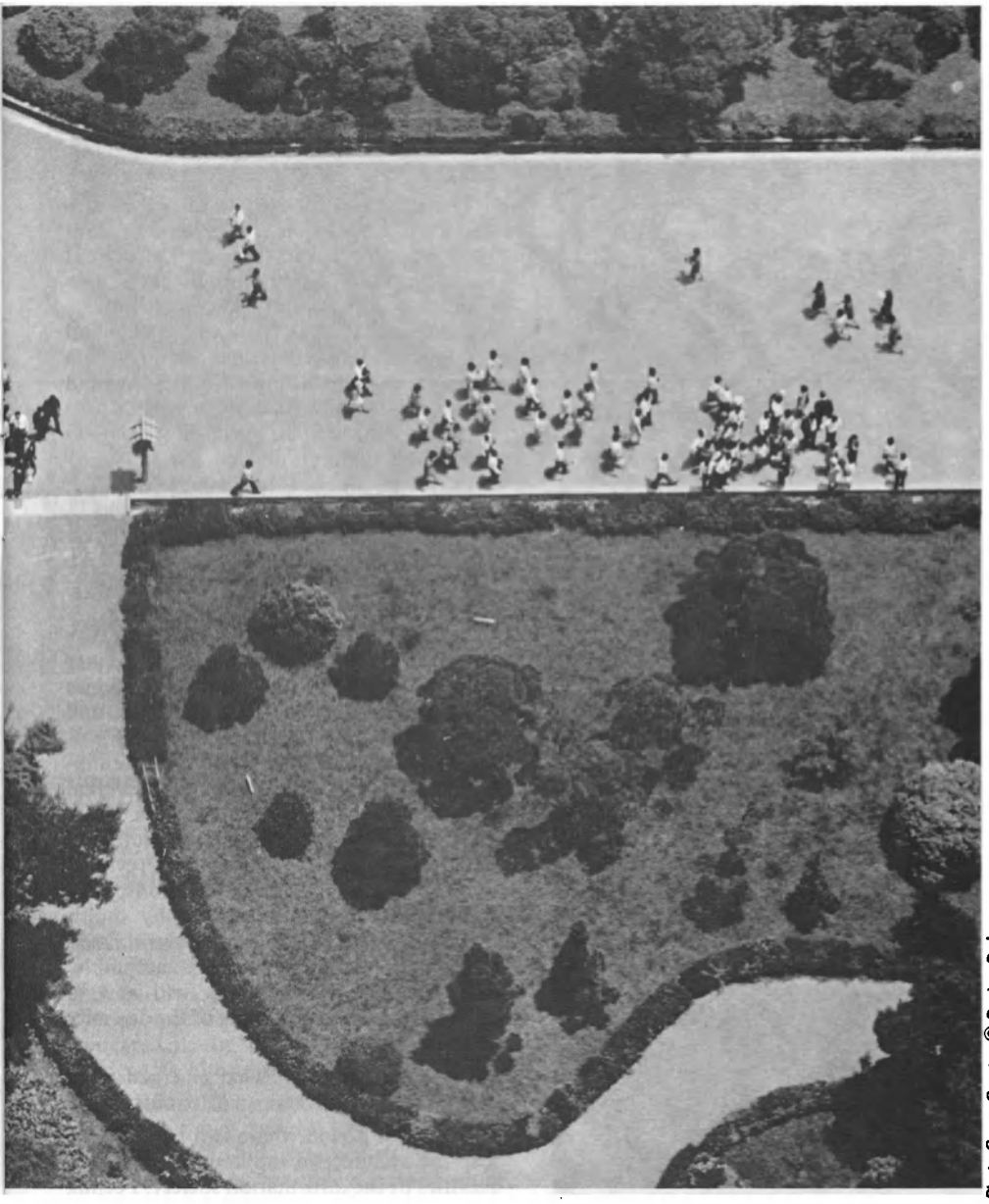


Photo Georg Gerster © Rapho, Paris

***Entrance and gardens of the shrine of Ise, Japan.***

JAPAN
TSUKUBA
1985

# and the city

and Rome. I was particularly interested in a series of vast drawings depicting agoras and forums. At the same period I was an enthusiastic admirer of classical Japanese architecture and above all of the temple of Ise, one of Japan's most sacred Shinto shrines, which seemed to me a prototype of Japanese architecture, and of the Katsura Imperial Palace at Kyoto.

In 1946 I was asked to work on the plan for the reconstruction of Hiroshima. This experience was of paramount importance for me, enabling me as it did to glimpse the difficulty of rooting contemporary architecture in Japanese reality, behind which we could still discern the weight of tradition.

At that time there was a growing debate about tradition. I felt my own interest shift away from the Yayoi tradition, the basis of aristocratic society, towards the popular Jomon tradition. In a sense the Yayoi culture could be considered as refined, Apollonian, and the Jomon culture as crude and Dionysiac. But if tradition acted for me as a catalyst, stimulating the development of my ideas and present at the conception and preparation of my projects, it did not appear as such in the final result. Concern with tradition was related to our design approach but our methodology was a question of a different order.

The starting point of our methodology was a critical attitude towards functionalism. The different functions of a building are as numerous as its users. The totality of these functions had to be taken into account.

In the case of a city hall, for example, it is clear that all kinds of requirements imposed by the mayor, the councillors, the staff, and visitors, must be considered. In view of this diversity, it is of crucial importance in a methodological approach to know what the real function of a city hall is. At this point the concept of *typology of functions* appears.

From all these arbitrary demands and functions we select those which seem the most human, the most essential, the most future-orientated: accompanied by a metaphysical content, the typology of functions thus comes to have a symbolic value.

My work on Hiroshima enabled me to develop certain concepts which brought into play the relationship between architecture and the city. The Centre and the Park of Peace became the heart of the city-memorial of Hiroshima...

I then came to realize the need for an additional element to the four functions defined in the Athens Charter*, one capable of endowing the city with a sense of entity and centrality. This element was the "urban core", a structural concept through which other cities could be provided with organic entity, like Hiroshima. I understood that where meeting places for the population were concerned, the architect's interpretation should go beyond the functional and should embrace more general concepts.

Strongly aware of the role of information in our society, I began to feel that urban and architectural space, formerly open and unconfined, actually exercised a force of attraction. I felt increasingly that space, which I had previously interpreted as being created by the separation of physical objects, actually exercised a force which held these objects together. I slowly came to consider space as a truly active binding force. My certainty that this was so caused a basic change in my way of thinking about architecture and city planning.

Structures exist in several dimensions. Dynamic relationships have physical structures. Structures permit the association of elements. Space itself transmits messages to people. In linguistic terms, structure establishes the grammar of messages. It is the channel whereby people can communicate among themselves. We came to ▶

** The Athens Charter stemmed from the fourth International Congress of Modern Architecture (CIAM) in 1933 and dealt with what were considered the four primary functions of the city: dwelling, recreation, work, and transport.*

Photo Christophe Kuhn © Rapho, Paris

***Detail of the convent of Notre-Dame-de-La-Tourette (1957-1959) built in France by the Swiss-born French architect Le Corbusier (Charles-Edouard Jeanneret-Gris, 1887-1965), whose work and ideas have influenced Kenzo Tange. The structure shows Le Corbusier's taste for plastic effects and the freedom of his use of raw concrete, on which the imprint of the formwork can still be seen.***

▶the conclusion that it is impossible to *understand* a building, a group of buildings, or urban space, without introducing the concept of structure into our thinking.

The proposal for structural reorganization contained in our Plan for Tokyo in 1960 was a first step towards a structural rather than a functional approach. In this plan, we attempted to comprehend the structure of Tokyo in terms of mobility and communications. We then proposed a structural reorganization which would transform the city from its enclosed, centripetal structure to an open, linear and expandable structure.

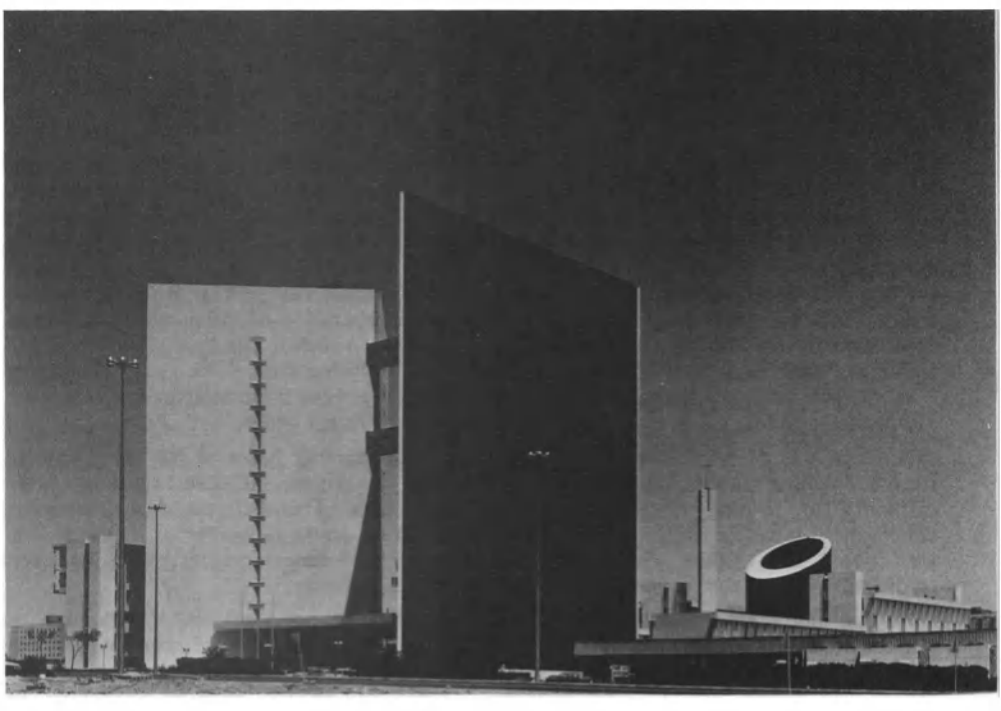
From this approach the concept of the urban axis was born, a concept which is now almost universally accepted.

In the Plan for Tokyo, the urban axis was a symbolic as well as a physical structure.

In the 1970s the complexity and diversity of world problems became even greater than before. Politically, the world had to face tensions between East and West and North and South. All aspects of the problems which arose were so closely interlinked that independent solutions to individual problems became impossible. A multidimensional approach was required to understand what was happening. Previously seen in terms of linear equations, problems now had to be solved by multidimensional equations. Some even claimed that no approach was perfectly acceptable. They decided to leave the field and to sidetrack the issue by talking of the diversity of criteria of values.

But in my opinion, what emerged from all this was not diversity but confusion.

In such a period, there is a tendency to lose the architect in the labyrinthine complexities of the information society. Feeling that he can trust no one but himself, the architect falls back on a highly individual aesthetic. Historically, in *fin de siecle* periods, people have tended to put all their faith in beauty alone, to become aesthetes who, incapable of judging the kind of beauty which is appropriate, search for anything new or unusual. They are convinced that



***The first phase of the King Faisal Foundation Headquarters Complex at Riyadh, Saudi Arabia, was begun by Kenzo Tange in 1976. The Foundation's offices are in the two triangular towers in foreground. The vast Complex also comprises a mosque, a religious school and library, and an apartment building. Simple geometrical forms have been used throughout.***

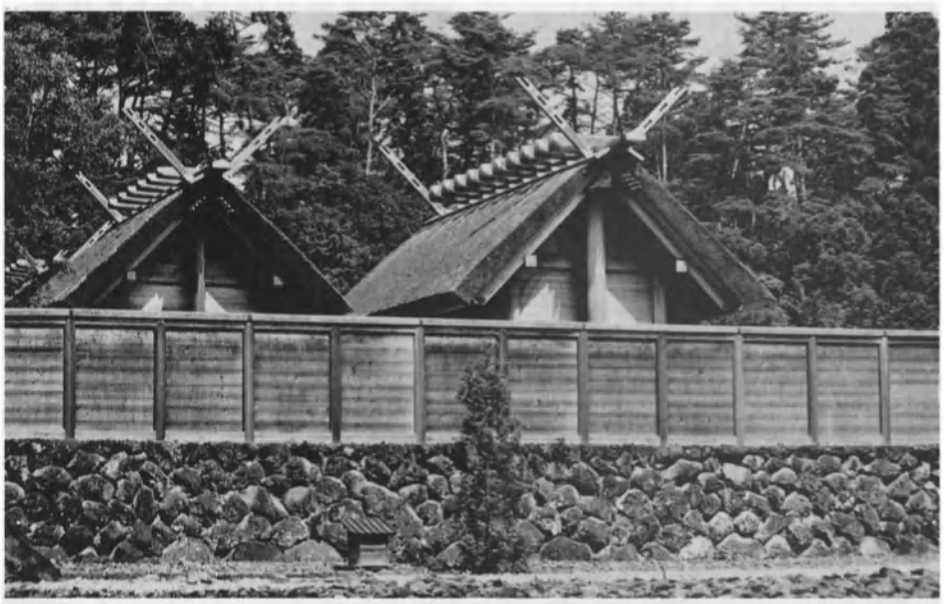


Photo Paolo Koch © Rapho, Paris

***Kenzo Tange blends the forms of modern architecture with those of popular Japanese tradition, one of the oldest examples of which is the Shinto Inner Shrine of Ise, the* naiku *(left), which probably dates back to the 7th century. The wooden buildings reproduce in highly developed form the architecture of the simple peasant houses of ancient Japan. They are built on piles, and their steep thatched roofs are crowned by elaborate ridge timbers.***

***Right, the 1,000-room Akasaka Prince Hotel, Tokyo, a 40-storey tower built by Kenzo Tange. The basic concept and design were decided in 1972 and construction was completed in 1982. Although the façades are partially clad with aluminium, the use of mirror glass produces the effect of lightness and transparency sought by the architect.***

they must create something different in order to express themselves within this multiplicity of values. This is how I interpret the post-modernist experiments which appeared in the 1970s as an antithesis to modern architecture.

Modern architecture can, I think, be defined by two periods. In the first, it adapted itself to industrial society. In the second, in which we are today, it must adapt itself to the information society.

The first period of modern architecture was that of the projects of Le Corbusier and Walter Gropius, expressions of industrial society, all of which bore the unique imprint of these Masters of architecture. My own work is an attempt to answer one question: what should the architecture of the information society be?

I feel it is obvious that modern architecture has entered its second period. Although I am not keen on the term post-modernism, it indicates the resources and the new visual vocabulary which will perhaps contribute to the creation of a new language for the architectural age to come.

I do not think, however, that post-modernism can become the expression of the information society.

The objective of my research is to discover the architectural and urban language proper to this new society. ■

Photo © Studio Murai, Tokyo

Photo © Studio Murai, Tokyo

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**KENZO TANGE** *is an internationally known Japanese architect and city planner. His best known early work was the Peace Centre at Hiroshima (1951-1956). Among his more recent buildings are the Akasaka Prince Hotel in Tokyo and the King Faisal Foundation Headquarters Complex at Riyadh, Saudi Arabia (see photos) In 1984, Kenzo Tange was elected to the* Académie des Beaux-Arts *of the* Institut de France. *The article published here has been extracted from the address he gave on his reception into the* Académie.

Tomorrow's habitat

## Award-winning projects from 10 countries

# ARGENTINA

### ARCHITECTS

Bibiana A. Ponzini
Eduardo A. González
Susana N. Nari
Eduardo H. Piaggio
Roberto O. Monteverdi

Hundreds of thousands of persons, mostly belonging to hunting and fishing communities, are periodically made homeless by heavy flooding of the Rio Parana. Many are unable to return to their traditional way of life on the banks of the river and are sheltered "provisionally" in deplorable conditions. The project envisages "a solution to this urgent problem, which will enable flood victims to return to their localities and work in a better organized, collective fashion" based on a form of accommodation which exploits the benefits of modern technology yet also conserves the essential features of the traditional structure. Built on piles for protection against the floods, the dwellings will be provided with modern equipment such as biogas production and storage facilities, windmills and charcoal ovens. They will be constructed using locally available materials such as wood, straw, osier rods and sand.

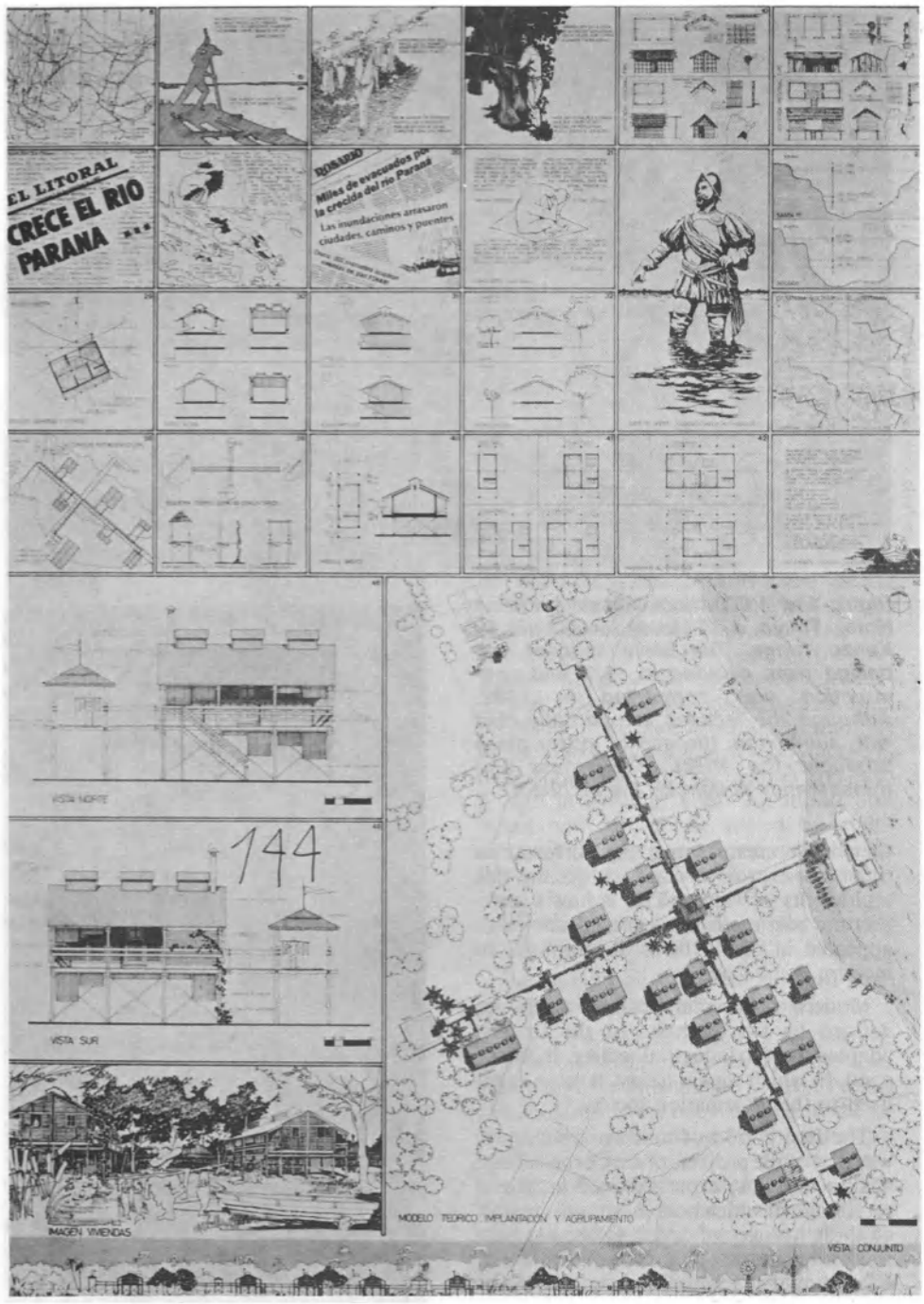


Photo Unesco/Jean-Claude Bernath

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# BYELORUSSIAN SOVIET SOCIALIST REPUBLIC

## ARCHITECTS

Valery G. Keskevich
Nicolas A. Pushkov

The setting for the project is Polesie ("cleared forest land"), the low-lying marshland covering almost one-third of the territory of the Byelorussian SSR. "The objective was to create an agro-industrial ecological structure harmoniously incorporating dwelling, production and maintenance units. The complex is equipped with an autonomous energy system functioning on the basis of solar, wind and hydraulic power and energy from biosynthesis. The traditional Byelorussian wooden peasant dwelling, the *khata*, was taken as the prototype of the housing unit. The project features industrial building materials using industrial and agricultural wastes... Each housing unit in the complex has a vast terrace."

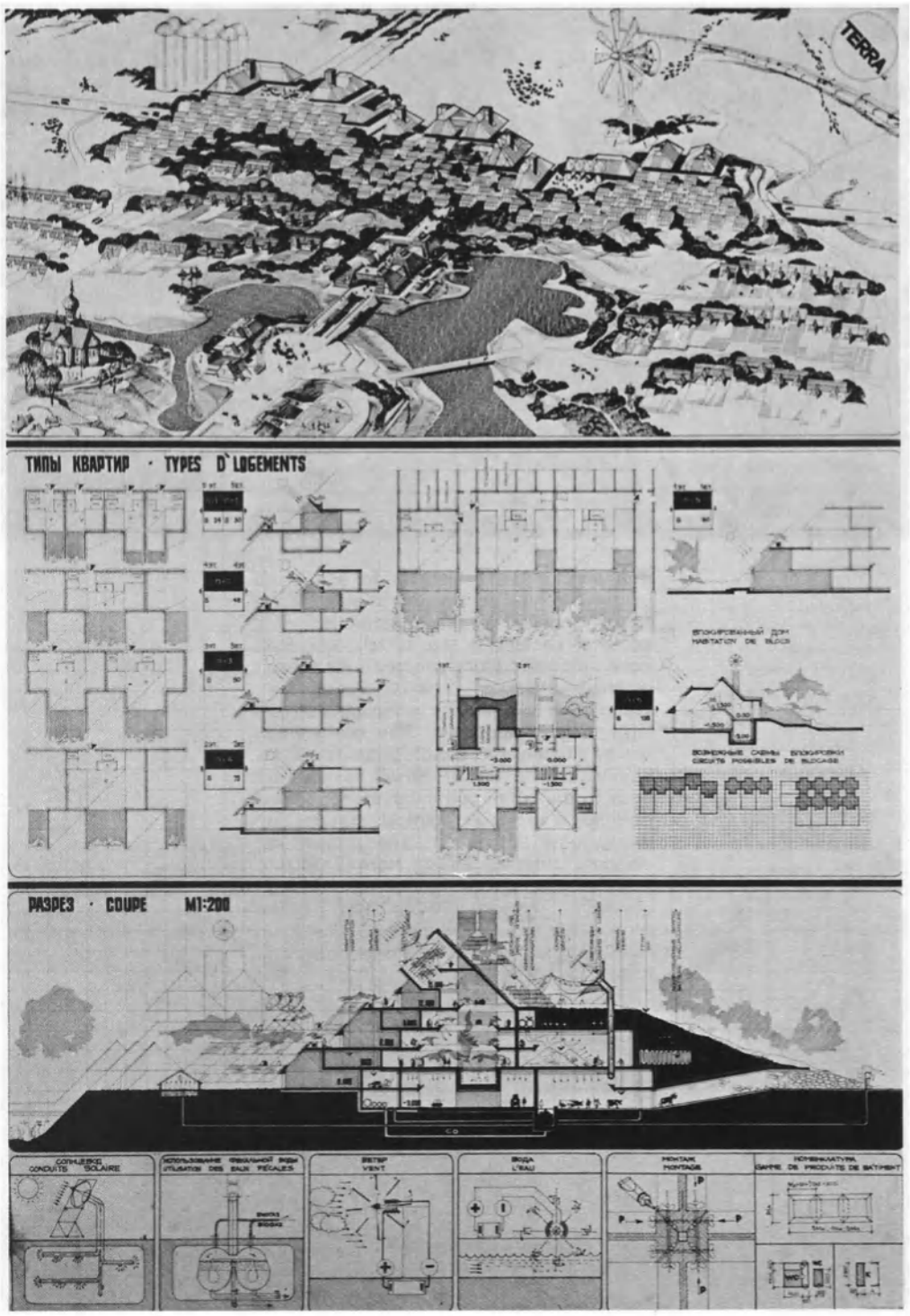



Photo Unesco/Jean-Claude Bernath

Tomorrow's habitat

# CUBA

## ARCHITECTS

Jorge Tamargo González
Alberto Rodríguez Alvarez
Andrés Hernández Jiménez
Marisela Biebla Aguiar

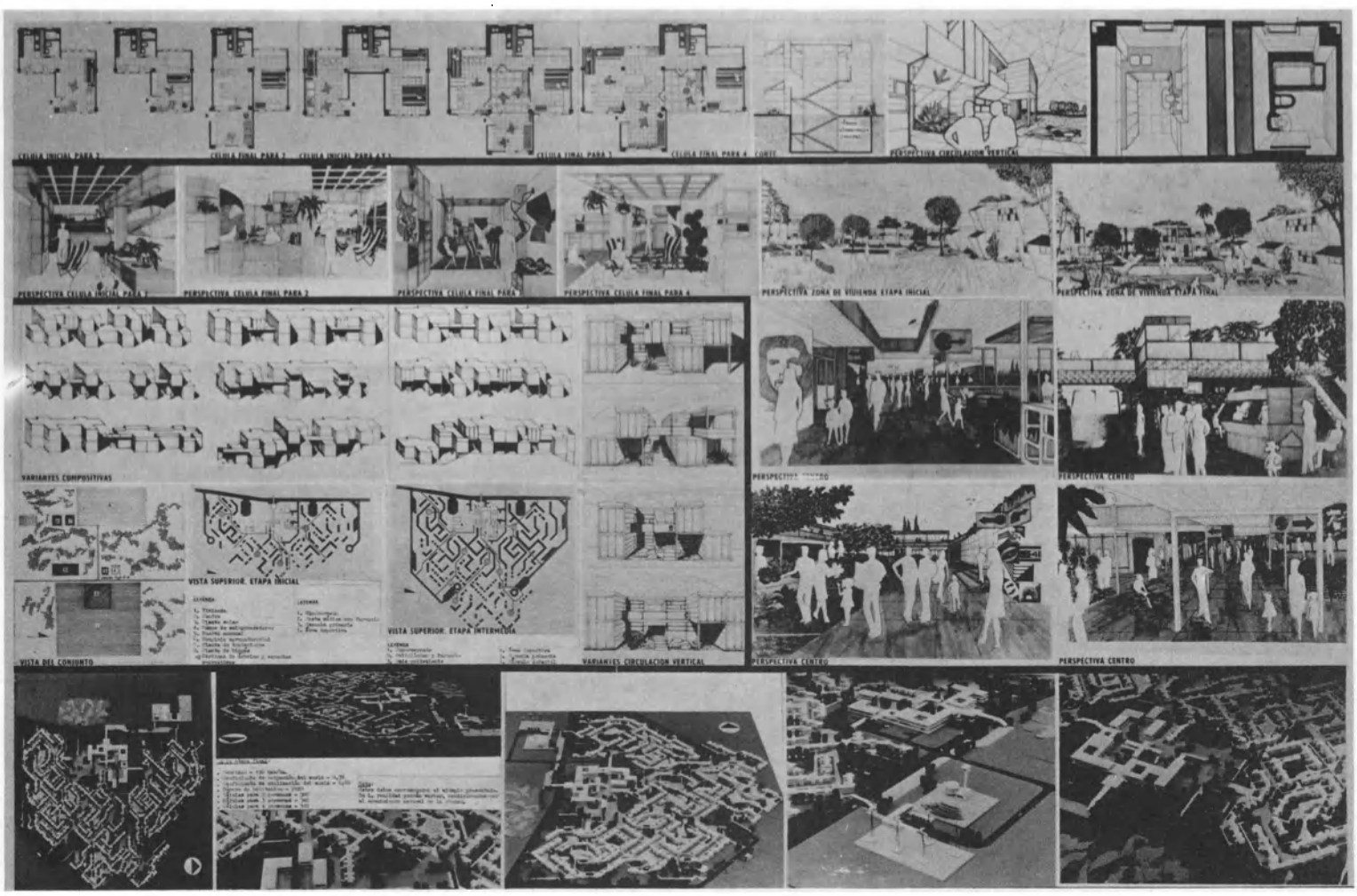


Photo Unesco/Jean-Claude Bernath

The aim of the project is to adapt the grassroots rural community to present and future changes in the construction of a socialist society in the social, technical, economic and cultural spheres... As a result of these changes, "the differences between town and country will have been to a large degree abolished. The countryman will be a technician, a professional man or a highly qualified worker. He will have full access to the entire cultural system and will participate in social, political, cultural and recreational activities." The project envisages communities of from 2,000 to 5,000 persons, thus countering any trend towards rampant urbanization. The technology must be simple and adapted to construction by the users themselves. Locally available materials will be widely employed. The urban structure will be dynamic and capable of adapting to changing needs. Facilities will include a biogas plant, a wind-powered generator, a solar energy unit, and a market garden to provide for the needs of the community.

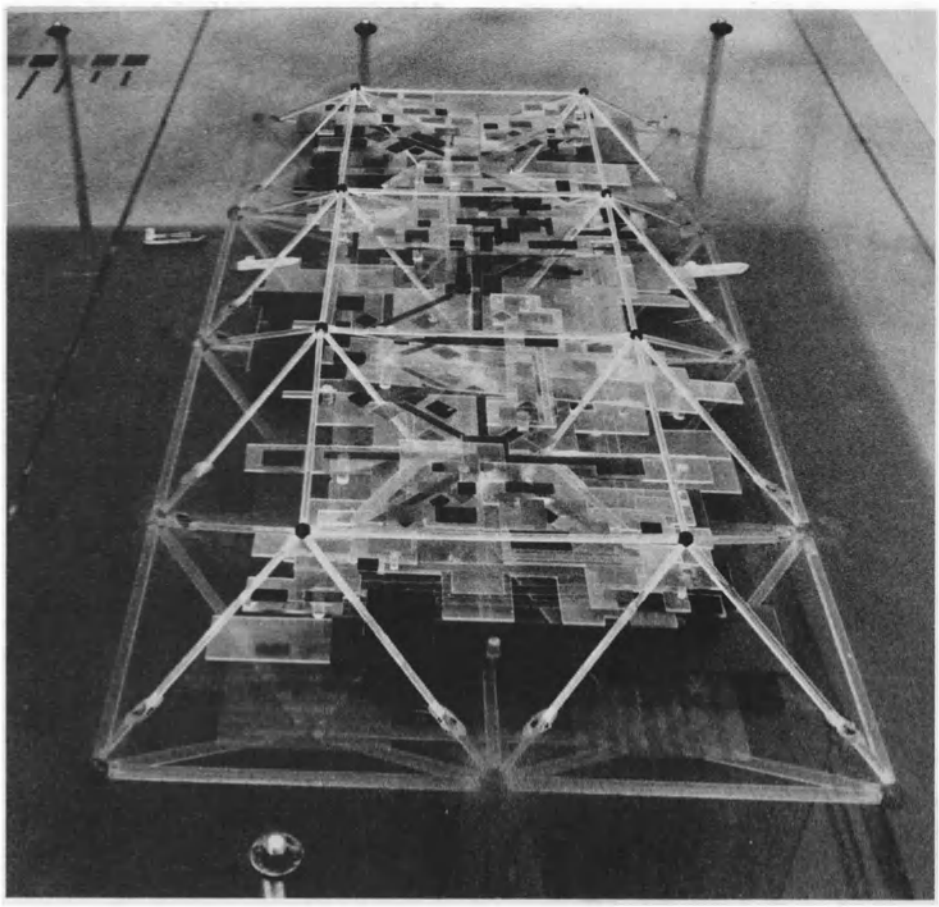
Tomorrow's habitat

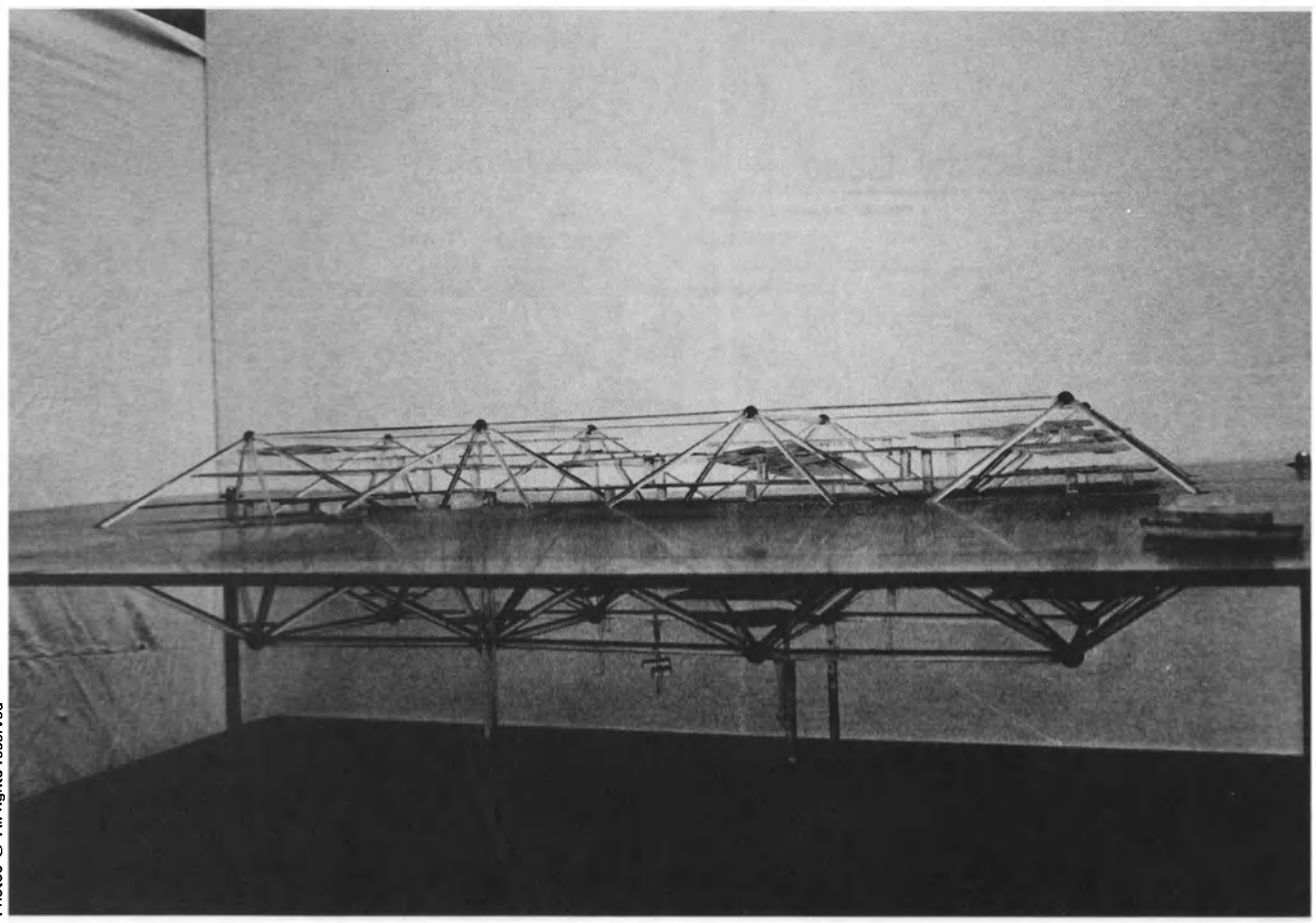
## FRANCE

### ARCHITECTS

Pierre-Alain Uniack
Christian Menu
Christophe Daguin
Ewa Struzynska

Project Aquapole is a "megastructure for a city of the sea". This mobile floating unit is both a tool for exploiting the wealth of the oceans and an autonomous city for 10,000 persons and their families created in accordance with the imperatives of the environment. Aquapole's activities include aquaculture, shell-fish cultivation, the exploitation of metal nodules and hydrocarbons, the desalination of sea water, petrochemistry, metallurgy and research. The tubular structure consists of eight double pyramids, with activities on three levels: at, above, and below sea level. In the upper part of each of seven pyramids is a living area for some 3,000 persons, divided into "villages" with services, shopping and leisure facilities. Solar energy panels are integrated into the housing structures. There is a three-tier transport system: elevators and mobile platforms providing access to the "villages" are linked to secondary axes served by the main Aquapole transport network (aerotrains, heliports etc.). In order to resist the salinity of the marine environment, carbon fibres, optical fibres, synthetic resins and other synthetic materials are widely used.





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Tomorrow's habitat

# INDONESIA

## ARCHITECTS

Arig Hidayat
Hendro Sangkoyo

A development model for fishing villages on Serui Bay, Irian Jaya, Indonesia. Most of the members of these struggling maritime communities live in a subsistence economy and they are considered as marginal groups to be relocated or persuaded to take jobs on land. Clusters of structures built on piles incorporate living units, sea-farming and hatchery areas, a vocational school, market-place, administrative and co-operative buildings. "Obviously, for the Seruians the face of the future will not take the shape of... megastructures designed for the social and economic setting of developed countries. And more important, any progress made in the expression of the physical environment (architecture) will only be a small part of multi-dimensional community development. Therefore in the model development scheme proposed the architectural expression could always be changed from the physical configuration designed for Serui Bay to a configuration for a location with a different social and economic setting."

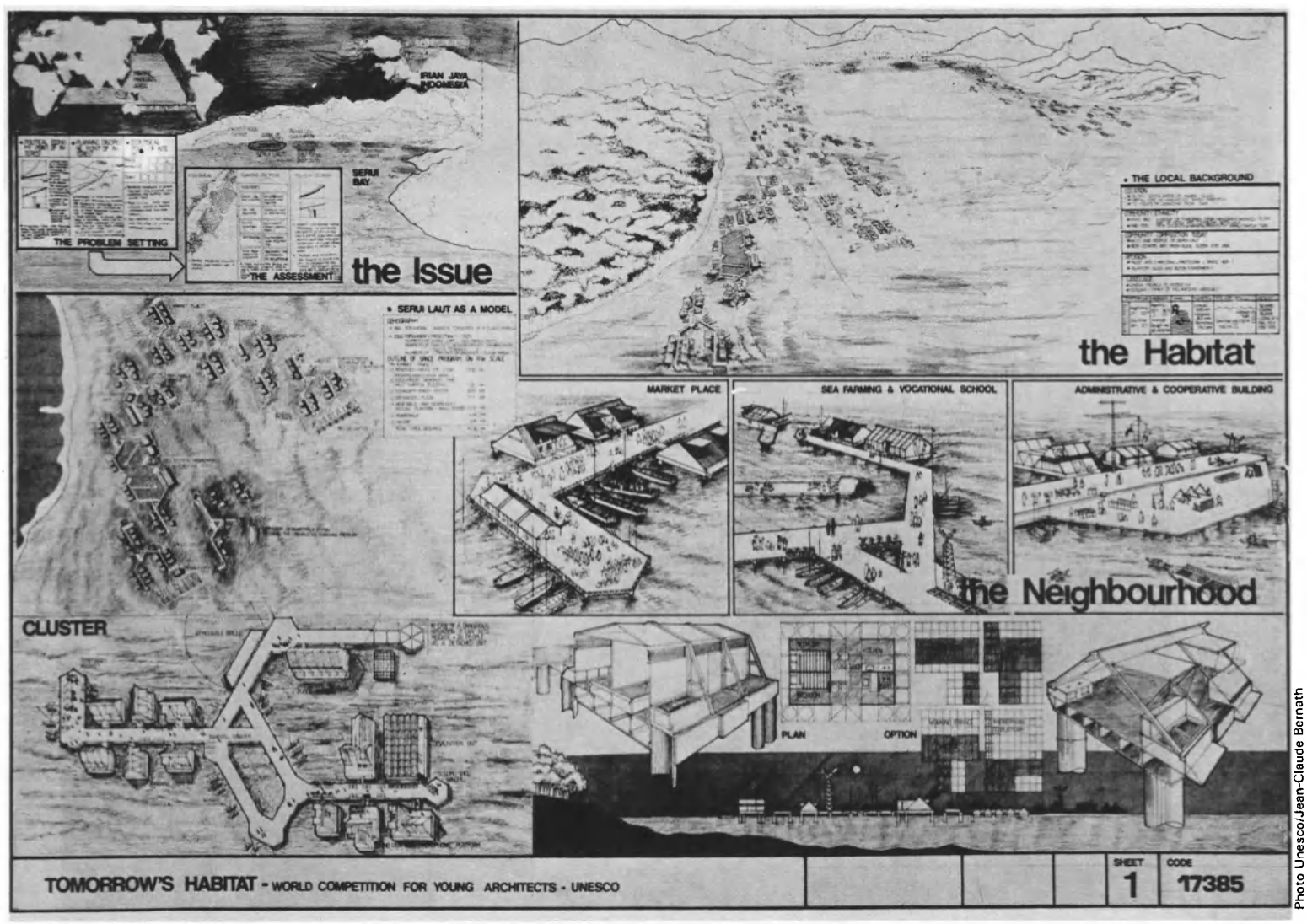



Photo Unesco/Jean-Claude Bernath

# JAPAN

## ARCHITECTS

Munetoshi Kawaguchi
Ryoko Kawaguchi

Tomorrow's habitat

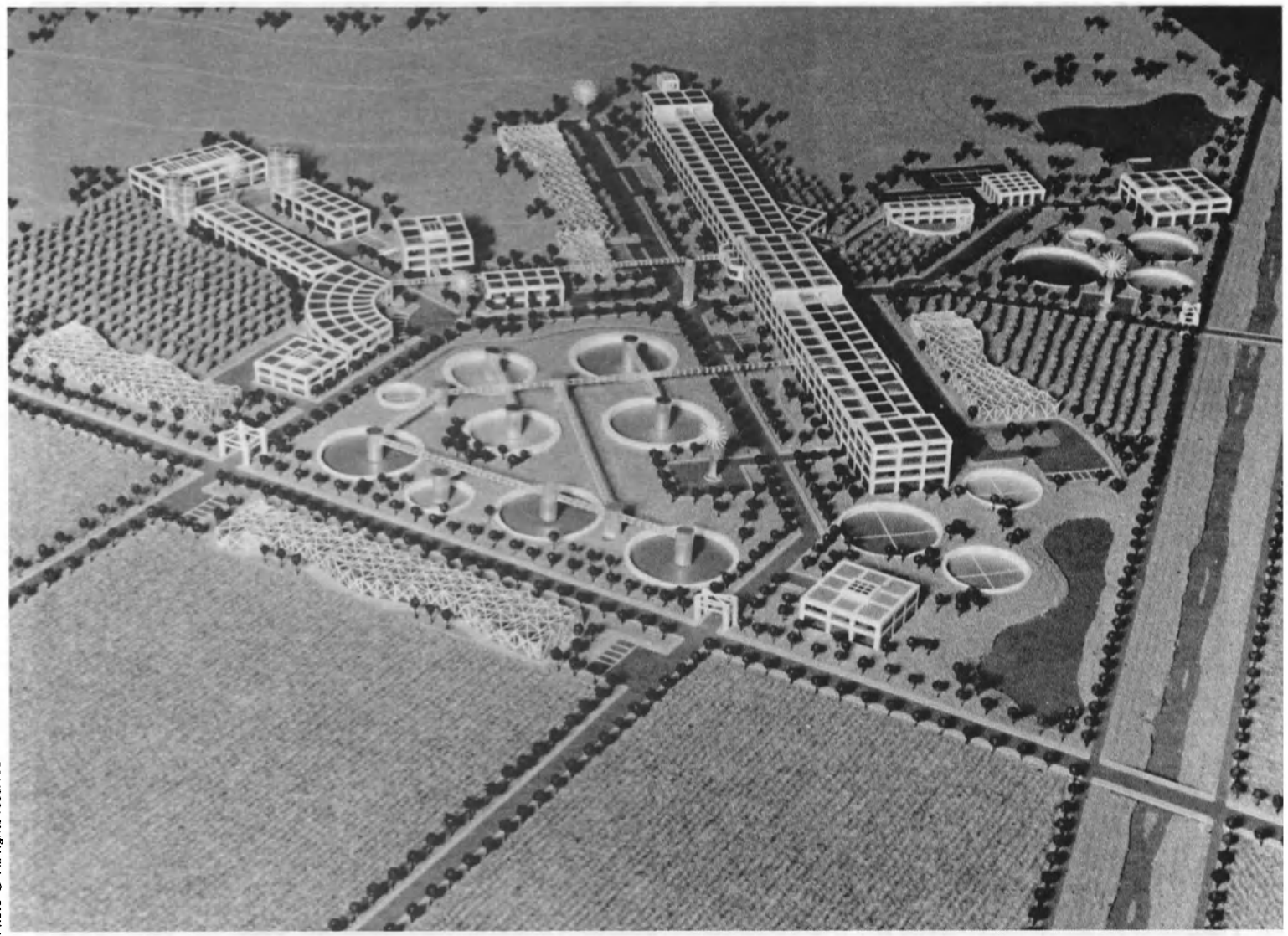


Photo © All rights reserved

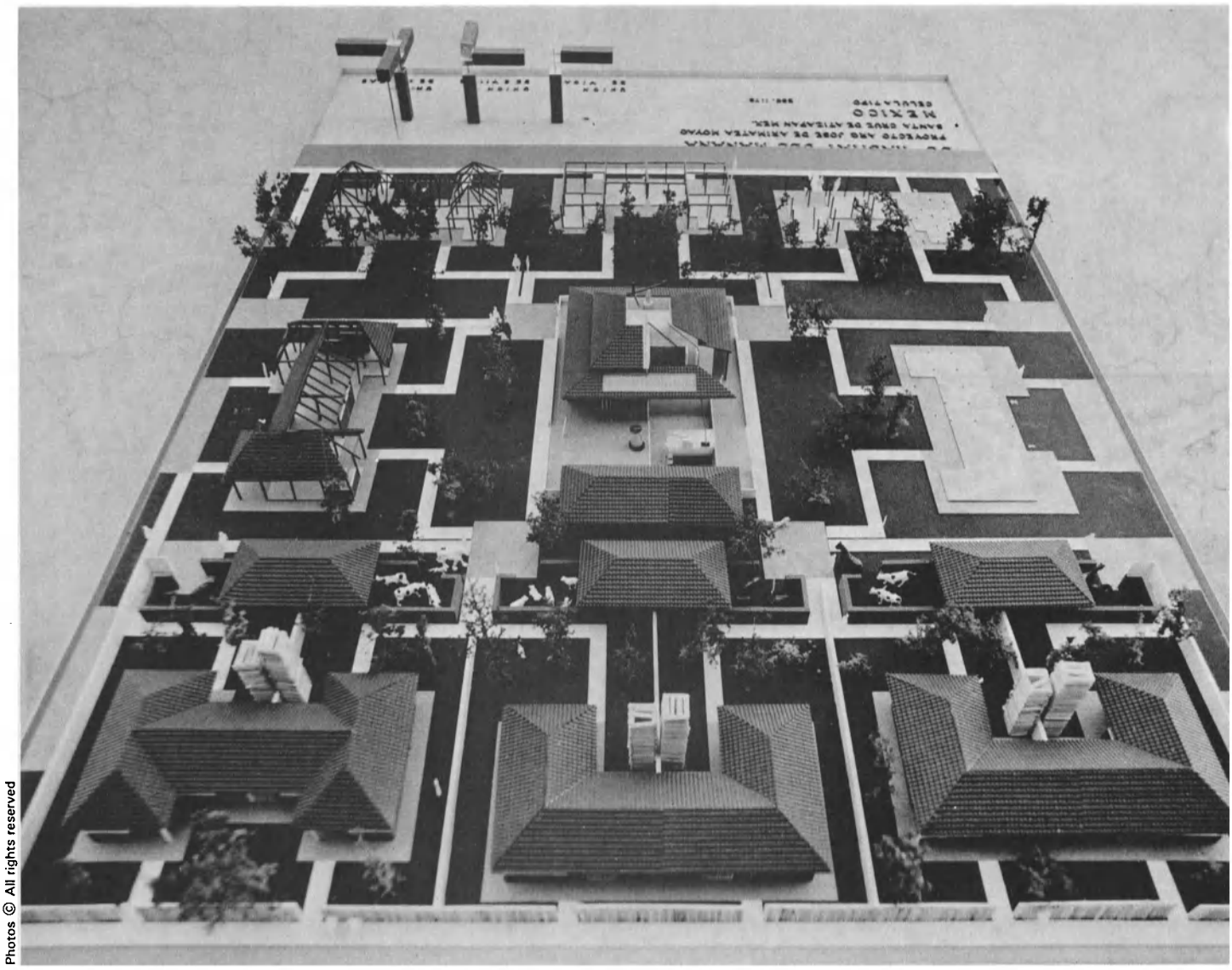
"Suburban Green Community" is based on the exchange between rural and urban communities, harmony with the natural environment, and the harnessing of advanced technology. The long main structure is a combined housing, training institute and agricultural factory block. Farmers' dwellings are located on each side of a "community corridor" on the ground floor of the three-storey building. Other buildings house mink, chicken and earthworm farms. Circular ponds at left of main building are for growing water hyacinth and green algae (chlorella). Fields and orchards surround the community buildings. Energy conservation is carried out by the use of solar and wind power energy, production of methane from wastes and biomass. The river (right) and reservoir (top right) provide recreational space, habitat for wild life, and protect against flooding. City dwellers can participate in work of the experimental farm on weekends and vacations. Farmers sell surplus products at a Sunday market.

Tomorrow's habitat

# MEXICO

## ARCHITECT

José de Arimatea Moyao López



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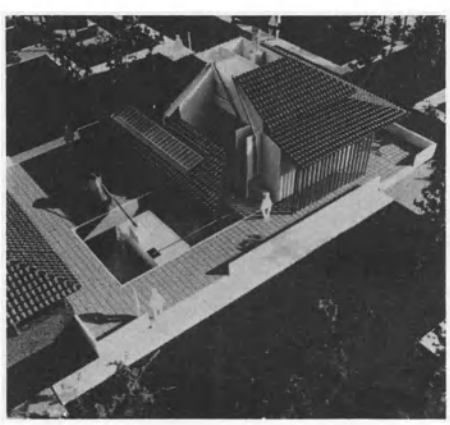
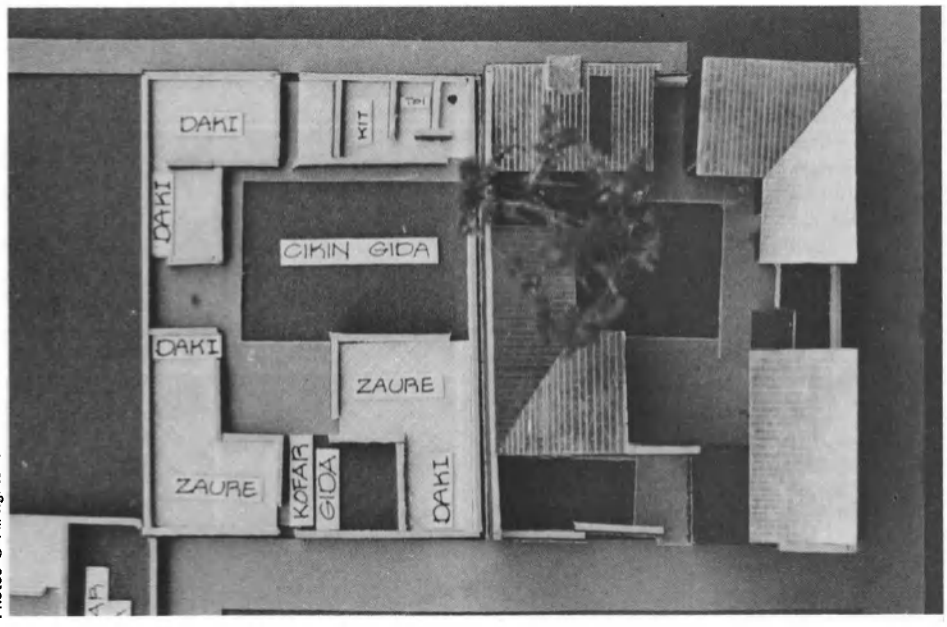
The "modular rural dwelling" project envisages the reorganization of Mexico's scattered rural settlements while preserving the traditional character of life in the countryside. It proposes the creation of cells of from sixteen to twenty dwelling units, each housing one family. The cellular conception is based on the typical Mexican neighbourhood in which dwellings are disposed around a central patio. The modular cells are designed in the form of windmill sails, with separate access for people and animals. At the centre of each cell is a nucleus of sanitary facilities which will exploit natural phenomena such as solar energy, wind power, and rain. Groups of cells will form *barrios* (quarters). The creation of a co-operative system will enable the modular cells to be constructed cheaply.



# Tomorrow's habitat




## NIGERIA

### ARCHITECTS

A. Duncan Ereomjuwa
O. Sobola Olusegun
E. Ndem Bassey
D.A. Adaramola Japhet

A project for the development of Jenta Adamu, a neighbourhood on the periphery of the city of Jos. "It is officially designated a slum mainly because it sprang up spontaneously from the spilled urban growth of Jos and identifies more with traditional growth patterns than any predetermined planning processes." The majority of the people belong to the Hausa and Birom ethnic groups, and the planning scheme originates in the traditional Hausa concept according to which the community has two connected foci: in the past the market and the palace, in this case the socio-economic focus (community centre, etc.) and the educational focus (vocational training centre, recreation field, etc.) connected by a pedestrian mall. Housing (for a population of 2,736 persons) consists of clusters of adobe brick dwellings built around the *cikin gida,* a multi-purpose internal courtyard.

Photos © All rights reserved

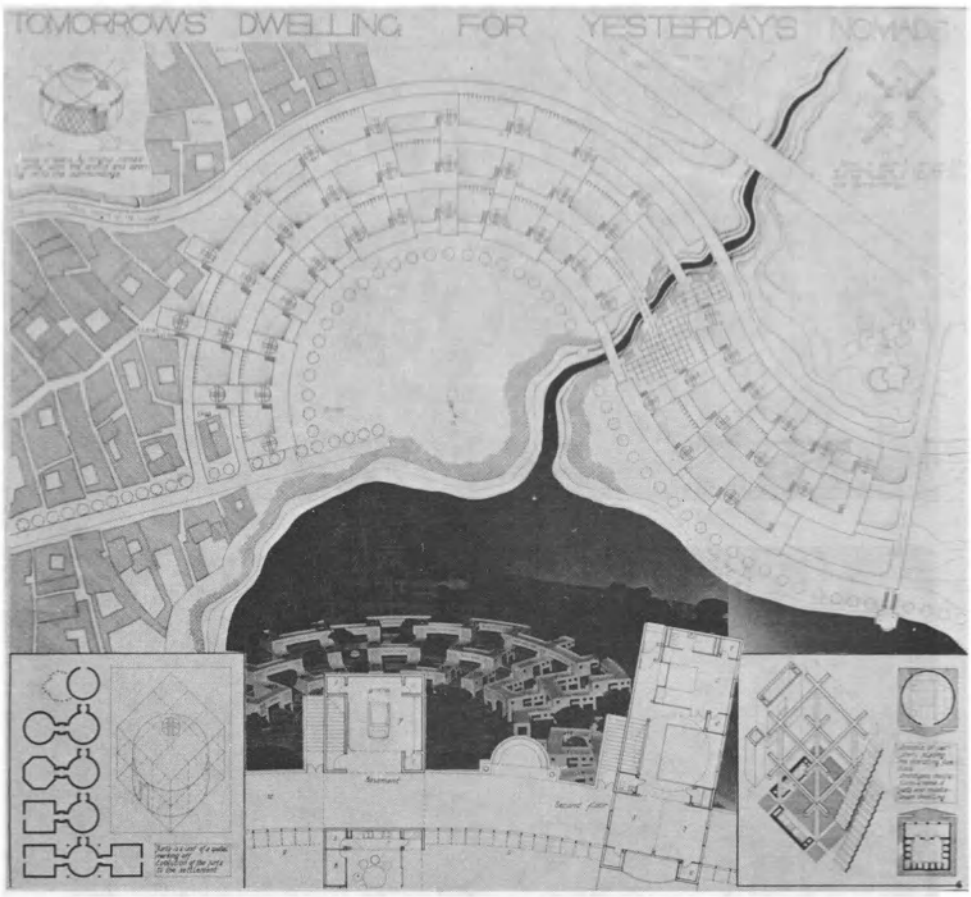
# Tomorrow's habitat

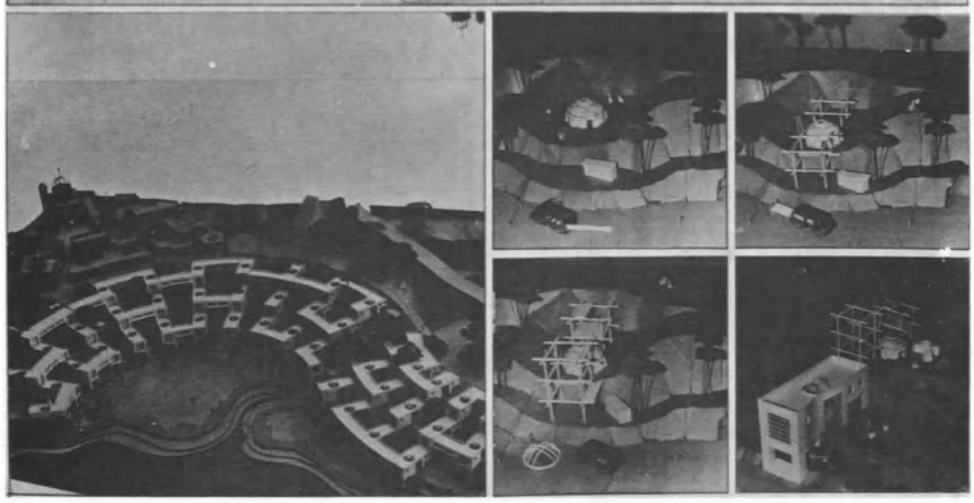
## USSR

### ARCHITECTS

Alexander Zusik
Serguey Ryspekov
Anatoly Zagrudny
Tatyana Ryspekova

A project for a community of forty former nomad families living on the shores of Lake Issyk Kul in the Kirghiz Soviet Socialist Republic. "The sedentarization of the Kirghiz nomads of Soviet Central Asia has brought many changes to the way of life of family and clan, to traditional forms of leisure and communication. Nevertheless, the tradition of living in families of three generations is still dominant in the Kirghiz house... The plan of this complex of forty dwellings obeys the principles whereby the Kirghiz nomad camp is organized, with the yurts (skin tents) disposed in a horse-shoe shape... On the other hand the traditional sedentary village of central Asia was the prototype for the use of different levels. The 'carpet' of dwellings which follows the folds of the relief is crossed by three covered streets, in which there are shops, services and a tea-house."





Photos Unesco/Jean-Claude Bernath

## SOCIALIST REPUBLIC OF VIET NAM

### ARCHITECTS

Nguyen Hoang Ha
Le Thi Dim Dung
Huang Dinh Tuan

The project for the reconstruction of a lakeside village specializing in flower-growing near Hanoi takes into account traditional experience and exploits new hothouse techniques and geothermal energy. The plan provides for combinations of residential units, with a garden for each family, a flower market. "Each apartment will... serve the purpose of housing and flower production... The ground floor will be airy, the interior will communicate with the garden outside. Collapsible bamboo or wickerwork partitions will separate these two areas during the cold season. The ground floor will be a place of contact with the cultural, social and economic environment, a place for rest and recreation and seedbeds... Salon and bedrooms will be on the first floor... The space between the roof and the first floor ceiling will be arranged for use as a 'greenhouse' for fragile flowers and the treatment of seedlings."

# A city for the year 2000

*by Oscar Niemeyer*

***Unlike Brasilia, created to be an urban area in harmony and contact with nature. São Paulo has experienced rampant growth and virtually all its green spaces have disappeared. Photo shows São Paulo's Coán building, designed by Oscar Niemeyer.***

Photo Paolo Gasparini, Unesco

CITIES have always changed under the impact of progress, technological change, new forms of communication, and human indifference.

In the past, city life was easy; it was more natural, and there was a greater sense of community. Then the little squares where people got together, the markets which brought animation to the narrow streets, and the quiet tree-lined residential districts all disappeared, with the spread of shops and businesses created to satisfy everyday needs.

The development of new means of production and transport, new urban activities, and, above all, the industrial revolution, transformed cities into dynamic metropolises bustling with life but lacking the intimacy which is so indispensable and which was theirs in the past.

Cities have existed for thousands of years... and perhaps the people of Nineveh and Babylon—certainly those of Rome and Alexandria—faced some of the problems which confront the modern city-dweller. But metropolitan centres were then very rare, and they may be considered a twentieth-century phenomenon. In his essay *On the Populousness of the Ancient Nations,* the eighteenth-century philosopher David Hume (1711-1776) maintained that no city would ever have more than 700,000 inhabitants. William Pelter was convinced that the maximum population of London would be five million. More realistically, Jules Verne (1828-1905) envisaged cities with a population of up to ten million. But the demographic growth of cities in the modern world was to exceed all these expectations.

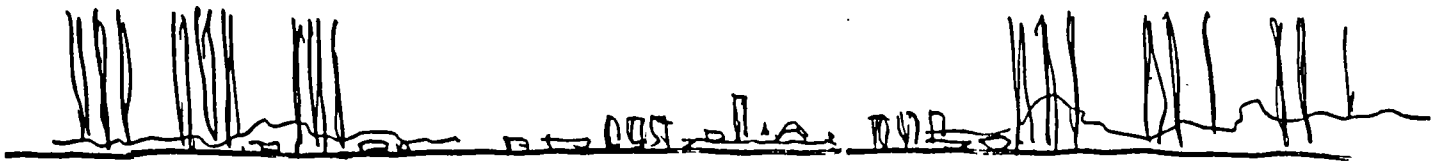
Houses for five persons were replaced by apartment blocks for two hundred; cars and pedestrians packed the streets; the population density of urban areas skyrocketed; traffic, noise and even security problems began to preoccupy the city-dweller.

"Urban surgery" drove thoroughfares, viaducts and level crossings through the city fabric, and inevitably left scars, while man, a forgotten and frustrated figure in the anonymous crowds, was stifled by his own lack of foresight.

Old tightly packed city districts were an inviting target for demolition as magnates constructed vast unsightly building complexes which disfigured the landscape with their total indifference towards man and nature.

As the implacably monotonous glass cubes of rationalist architecture rose above the streets, the old cities lost their former unity.

Such is the explanation usually given for the phenomenon of urban growth by those who almost invariably forget the odious social discrimination which it involves. New possibilities have emerged only in those countries where the institution of landed property has been abolished. On the other



*"... it will be a vertical city, one where distances will be reduced, thus fulfilling its principal purpose". Drawing by Oscar Niemeyer.*

hand, the same errors continue to be made in all Western cities: the rich have taken them over, while the poor are relegated to wretched quarters on the periphery.

From the "industrial city" project drawn up in 1907 by the French architect and city planner Tony Garnier to the Charter of Athens of 1933 (see note page 5), countless urban planning projects have been proposed but all, including the Charter itself, are today strongly contested. Solutions must be more coherent and more human; the streets must be restored to pedestrians; the urban fabric must again possess the organic unity it has lost; and the creation of large areas which are deserted outside working hours must be avoided. Specialists talk passionately about the problems of big cities and issue a barrage of criticism: of pollution, of the power of vested interests, of intolerable crowding, of excessive distances between work-place and home, etc. But when it actually comes down to the *favelas* (shanty-towns), and children wandering through the streets, and the workman who leaves home at dawn and only gets back at night without ever seeing his children, the discussion conveniently evaporates, as if these were natural and acceptable phenomena.

In such an appalling social context, the city of the year 2000 cannot be built. As envisaged today, this city would merely reproduce, perhaps more aesthetically, the discriminations and injustices of the capitalist world.

So what is to be done? How can we Latin Americans, still oppressed by the old privileges created by the bourgeoisie, conceive of a city which calls first and foremost for a classless, just and interdependent society?

How can we imagine this ideal city if we live beneath the yoke of dictatorships and the chains of servitude, and when privileges, landed property and authoritarianism frustrate all our efforts. How can we define the nature of the city of the future if poverty besets us and injustice forces us away from the drawing board to respond to the promptings of our conscience and sense of solidarity, take part in politics and cry out our indignation and revolt?

But we can always dream a little and present our modest proposal for the city of the future. At the outset let us say that it should not, in our opinion, be backward-looking; it should not turn towards those medieval cities which attract us so much today, but at the same time it should preserve something of their tranquillity and their human dimensions, two essential qualities which have fallen victim to human progress and incomprehension. The city of the future will not be conceived for the machine; it will be built for man, who will be able to walk through it from end to end, as he did in olden times.

Thus it will be a vertical city, one where the distances will be reduced, thus fulfilling its principal purpose. The population density will be fixed in advance, in order to avoid the rampant growth which has disfigured the world's great cities. To enable pedestrians to move around freely, all vehicles will be left in outlying car-parks with direct access to the different sectors of the city, including the centre, with its administrative buildings, offices and shops. Sectors for health, culture, education and housing will stretch, according to the logic of urban organization, from the centre to the limits.

It will be a multipliable city. A series of cities designed on this model will be stretched along an axis, divided by immense green spaces for recreation and leisure. Parallel to these, areas will be allocated to agriculture, scientific research and the major industries.

This is the formula we propose. Many others are bound to be put forward, but we believe that it is in this smaller, more intimate, more human city, that man will one day rediscover the lost sense of community and the charm of city life, for which he has always felt nostalgia. ■

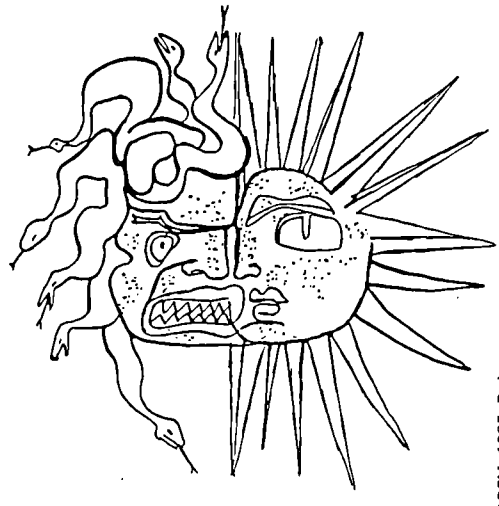
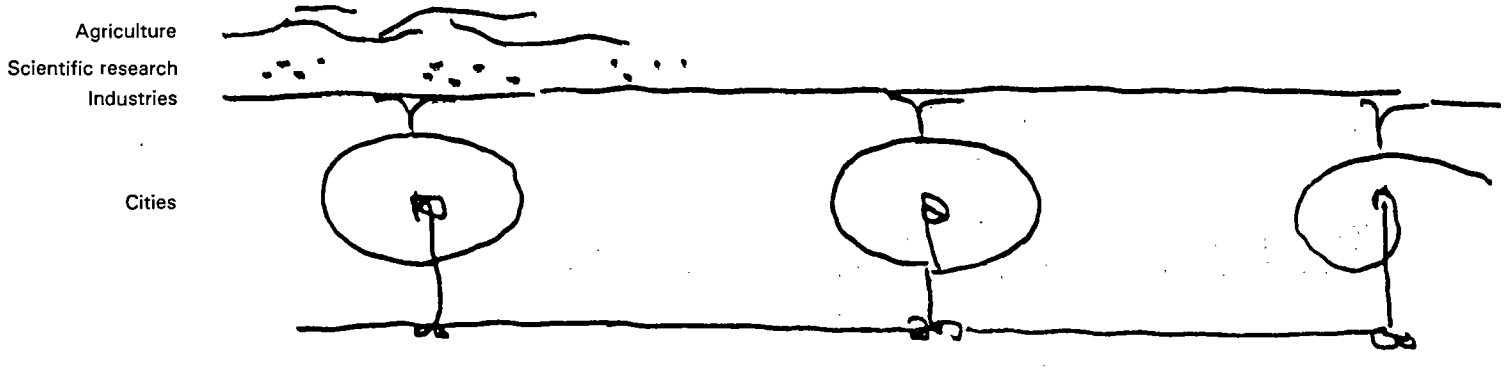


Photo © SPADEM, 1985, Paris

***The dilemma facing modern architecture—whether to provide a service for all users or to pursue the mirage of a better and better environment for a smaller and smaller fraction of the world's population—is evoked by Le Corbusier's drawing* The Contemporary Disaster or Freedom of Spatial Organization.**

**OSCAR NIEMEYER,** *of Brazil, is one of the leading exponents of modern architecture in Latin America, and won a worldwide reputation for his work on Brasilia, the new capital of Brazil. In 1956, the recently elected Brazilian President, Juscelino Kubitschek, asked him to design the government buildings for Brasilia. At Niemeyer's suggestion a nationwide competition was held for the master plan of the city. The competition was won by Niemeyer's former teacher, Lucio Costa.*

*"It will be a multipliable city. A series of cities will be stretched along an axis... Parallel to them areas will be allocated to agriculture, scientific research and the major industries." Drawing by Oscar Niemeyer.*



# The metamorphosis of Cairo

*by Hassan Fathy*

**A seminar dealing with one of the most pressing problems facing countries in the developing world today—the rapid growth of cities—was held in Cairo from 11 to 15 November 1984. The five-day seminar, entitled *The Expanding Metropolis: Coping with the Urban Growth of Cairo,* was the ninth international seminar sponsored by the Aga Khan Award for Architecture. The Award was established in 1976 "to encourage an awareness of the strength and diversity of Islamic culture which, when combined with an enlightened use of modern technology, will result in buildings more appropriate for the Islamic world of tomorrow". The article below is based on the keynote address to the seminar by the Egyptian architect Dr. Hassan Fathy, himself a laureate of the Award in 1980. The full proceedings of the seminar are to be published later this year as part of the Award series *Architectural Transformation in the Islamic World.***

Drawing © Jim Antoniou, London

***Street scene Zone 2 (see article page 22).***

THE Cairo of the future is an intriguing and enlightening subject of research. Suffering as it does today from most of the urban disorders typical of many other Arab cities, Cairo constitutes an ideal target for a case study.

At present Cairo is facing enormous problems in almost all areas of urban concern: congestion, shortage of housing, inadequate transport, entire lack of an adequate centre, lack of well-located public service buildings, and so on. Above all it is suffering from the problem of alienation and loss of identity in town planning and architecture caused by borrowing models from the West which do not fit, thus interrupting the natural urban development stemming from the environment.

Existing over-population, which is expected to intensify in the near future, requires the fashioning of a new Cairo that is an outgrowth of the present city with the addition of an area almost equal to its present size. This at once raises several essential questions. To start with, where will this Cairo be located geographically? What town-planning system should be adopted? What style of architecture should it have?

The site of the historical city has changed several times. At the beginning of the Islamic period, Fustat, the seed from which contemporary Cairo grew, was founded by Amr ibn al-'As, who built his palace and mosque there in 643.

Some two centuries later, Ahmad ibn Tulun found the palace much too small for the proper functioning of the administration and his large number of followers. So in 872 he built himself a large palace in a new quarter, at the foot of the hill on which the Citadel was later built, and distributed all the land surrounding it among his officers and courtiers. This new quarter was called al-Qatai, which means distributed plots, and it extended from the palace to the river. In 875 ibn Tulun built the famous mosque that bears his name.

Finally, in 971, after the successful invasion of Egypt by the Fatimids, the victorious commander, General Jawhar, founded a walled city further to the north for the Fatimid Caliph al-Muizz. When the Caliph arrived to make it the capital of his dynasty, the city was given the name it has retained to this day, al-Qahirah ("the Victorious"), or Cairo.

The city covered an area of some 150 hectares, but within a short space of time, during the reign of Caliph al-Hakim, the population had increased to 100,000 and the city was extended to the north and the south.

Medieval Cairo attained its apogee during the Mamluk era. By the mid-fourteenth century it had a population of some 500,000 and was the greatest city in all Africa, Europe and the Levant and the centre of Islamic learning.

Modern urban growth began during the nineteenth century. Gradually, as the river was brought under control and the riverside marshes were drained, the city spread towards the west until today it completely occupies the area between the Citadel and the river, with modern quarters in European style attracting the centre of the city from Muski to al-Khadra to Qasr an-Nil. Bridges were built and urbanization spread to the western bank of the river and the quarters of Zamalek, al-Awqaf and Madinat al-Muhandisin (City of Engineers) and others were constructed, extending the built-up area to the western desert thus encroaching on the green area which used to provide Cairo with vegetables.

As the population grew, the quarters began to extend to the north and the south and the city assumed a very elongated shape. In addition, the centre moved westwards at right angles to the main line of growth so that the form of the city ceased to represent the optimum configuration for the efficient functioning of the city, causing chaos and congestion.

Housing did not spread eastwards because of the Muqattam Hills and the military barracks, so the area adjacent to the city on its eastern border and extending to the Suez Canal remained unoccupied and could provide a site for the Cairo of the future. The best solution would be to site the Cairo of the future to the east with its linear centre extending lengthwise between the old and the new Cairos.

Nasr City, a new town begun in 1958 and situated to the east, gives an indication of the feasibility of the idea. The Saleh Salem road, which leads out to the airport, could have formed the linear centre if it had been designed sufficiently wide to allow for public service buildings, commercial buildings, fast and slow communications roads, car parks and so on. Unfortunately it was designed as an ordinary street. When Nasr City was built, chaotic building occurred to the east of the street in the area which is supposed to contain the Cairo of the future and its linear centre.

Furthermore, Nasr City was not designed as an integral part of the future Cairo. The situation urgently demands the drawing up of plans for the future Cairo in this geographical area, the definition of its architectural style and a decision to stop the construction of any building which does not meet the requirements of the site or its architectural pattern.

The planning of the future Cairo should be based on a system of quarters graduated in size in an organized manner and ecologically balanced so that every quarter, from the smallest to the largest, is provided

Photo Georg Gerster © Rapho, Paris

***Built around 1170 AD/566 AH by Salah ad-Din Yusuf ibn Ayyub, founder of the Ayyubid dynasty, the Citadel dominates historic Cairo from its site on a spur of the Muqattam Hills. Important features of the Citadel are its walls and towers and the Mamluk mosque of Nasr Mohammed.***

with the services appropriate to the number of inhabitants. We could adopt the concept of a city of graduated communities. Community Class One would be a street for about a hundred people; Community Class Two would be for five hundred people and would require a grocery store and a children's play area. Community Class Three, for one thousand people, would need an elementary school. Community Class Four, with between five and ten thousand people would be a village requiring a secondary school, a market and public service buildings such as banks and post and telegraph offices, etc.

Based on a density of one hundred people to 4,000 square metres, a Community Class Four would require a square plot measuring some 360,000 square metres. An area of this size would enable the majority of the inhabitants—secondary and primary schoolchildren, housewives, people going to sports meetings and social gatherings—to walk from their homes to their destinations, thus reducing automobile traffic within the quarter by no less than eighty per cent.

Community Class Four is followed by Community Class Five, for 50,000 people, and Class Six, for one million and more—from Metropolis to Megalopolis.

Modern urban planning attempts to separate heavy automobile traffic and pedestrians. This problem can be solved by having a ring road for cars around the residential quarter with *cul-de-sac* streets penetrating the housing area, serving just the inhabitants of the street, with a park in the centre surrounded by the houses.

To respect the human scale in the Cairo of the future we can use the Community Class Four as the basic unit. To ensure that man does not lose his sense of belonging to his quarter the streets have to meander, with closed vistas no longer than fifty metres, as in traditional Arab cities. In this way the streets, like the traditional Arab courtyard, will act as temperature regulators, and the architecture of the houses will be variegated to allow the owner individual expression while at the same time respecting the aesthetic factor. This variegation will give the closed vista area the rhythm of a movement in a sonata.

Architecture is said to be one of the most important elements of culture. Culture can be defined as the resultant of the interaction between the intelligence of man and his environment in satisfying his needs, both spiritual and material. The artistic value of any project depends on the answer to the question: "Is it for man, the psycho-biological man, or is it for some other purpose." If it is for man, then it can be discussed. If it is for any other purpose, political or economic, for example, then decisions can be taken without discussion.

With regard to the Cairo of the future, we have to define the man for whom we are planning and designing it and what his spiritual and physical needs in housing are so far as architectural design and town planning are concerned. This requires special research. Concerning culture and Arab civilization, we need to cope with the problem of alienation which dominates the Arab countries in the field of urbanization.

In modern Arab cities, the Arab has adopted an alien style in planning and architecture which could never have developed if he were reacting personally to his natural environment and respecting his cultural heritage. This problem of alienation was imposed upon us in the past from outside by foreign rulers and by the impact of the historical, cultural and economic changes resulting from the industrial revolution in Europe.

There is one most striking example of alienation in architectural design and planning in the modern Arab city. This is the replacement of *introversion* in the design of the Arab house, in which the living-rooms open on to the courtyard with its marble fountain, trees and aromatic flowers acting as a temperature regulator and protecting the intimacy that characterizes Arab family life, by *extroversion,* in which the living-rooms open on to the street with its black asphalt, exhaust fumes and noise.

The Cairo of the future can become a triumph of man's artistry, ranking with the world's finest examples of townscapes. If the characteristics of the contemporary city and the Arab identity can be combined in the Cairo of the future, it could become a model for Arab and Islamic countries. ■

**HASSAN FATHY,** *Egyptian architect and town-planner, has devoted his life to the development of low-cost housing techniques suited to the needs of the Third World. In 1946 he began work on the New Village of Gourna, near Luxor, Egypt, where his graceful, earth-built housing units, inspired by local traditional styles, broke new ground. His views on architecture, on low-cost housing and co-operative building are contained in his book* Gourna, a Tale of Two Villages.

# Unesco and the conservation of Old Cairo

*Street scene Zone 6.*

THE inclusion of the old city of Cairo in the World Heritage List by the World Heritage Convention, in 1979, underlined the international cultural significance of historic Cairo. But with over six hundred listed buildings in an expanding city whose population is expected to rise from twelve million to between sixteen and twenty million by the year 2000 the problems of preservation are enormous.

In February 1980, in response to a request from the Egyptian Government, Unesco undertook to send a mission to prepare a report on a conservation strategy for the old city of Cairo. The members of this mission made a number of visits during the period February to August 1980.

The team concentrated its attention on a study area of some three and a half square kilometres (see map) containing 450 listed buildings. They found that the resources available for the maintenance of these historic monuments were totally inadequate to the magnitude of the problem. The area's narrow medieval streets are choked with traffic, new and unsuitable industrial and business activities are driving out the traditional craftsmen and small tradesmen, and building fabric is deteriorating due to general decay, inadequate maintenance and the ravages of a rising groundwater table.

The team's report proposed two levels of priority action for the study area. The first of these covers the study area as a whole and suggests a general programme of housing improvement, limitation of the size, speed and number of vehicles allowed into the area and improvement of road maintenance, street cleaning and rubbish collection.

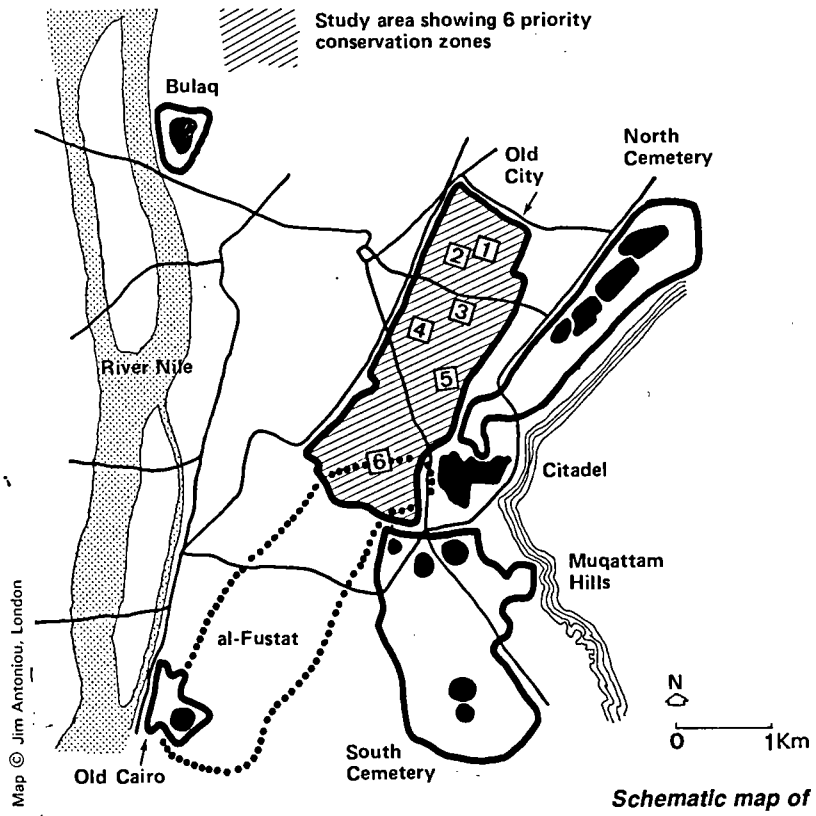
At the second level of action the report proposes a five-year emergency programme for six priority zones containing clusters of monuments. Within each zone urgent action is required to deal with the restoration of monuments, to control the design and construction of new buildings, to rehabilitate and improve existing sites and buildings, to introduce new compatible functions for monuments and to improve and contribute to the social facilities of the neighbourhood.

The six clusters of monuments have been selected to form potential conservation and rehabilitation zones and are spaced out at almost equal distances between the northern gates and the Ibn Tulun Mosque (see diagram), each focussing on a single street about 250 metres long. Each group is thus tightly integrated, yet they are spaced out in such a way that their upgrading will have the maximum impact on the whole of the central area of the old city.

The six priority zones or clusters and their general characteristics are as follows:

*Zone One,* centred on Sharia (street) al Muizz li-Din Allah, covers the heart of Fatimid Cairo and is the site of the former Fatimid palaces which were replaced by other major buildings during the Ayyubid and Mamluk periods. Historically the zone demonstrates the development of the typical Cairene madrasa-mosque with attached mausoleum of the founder. Major public buildings and commercial structures prevail, with shopfronts often obstructing the view of important monuments. Due to the vicinity of Khan al Khalili and the Sharia al-Azhar, this zone is the most frequented tourist area and, with its unique architectural heritage, represents a showcase of Islamic Cairo.

*Zone Two,* centred on Sharia al-Gamaliya, represents one of the finest and most homogeneous street scenes of the old city. It includes fine *wakallas* (buildings facing on to courtyards and consisting of shops on the ground floor with living quarters above) and *sabil-kuttabs* (buildings with a single ground floor room in which is installed a public fountain, with a balcony room above where young children are taught to chant the Koran) on the north-south spine of Fatimid Cairo, leading from Bab (gate) al-




*Schematic map of historic Cairo.*

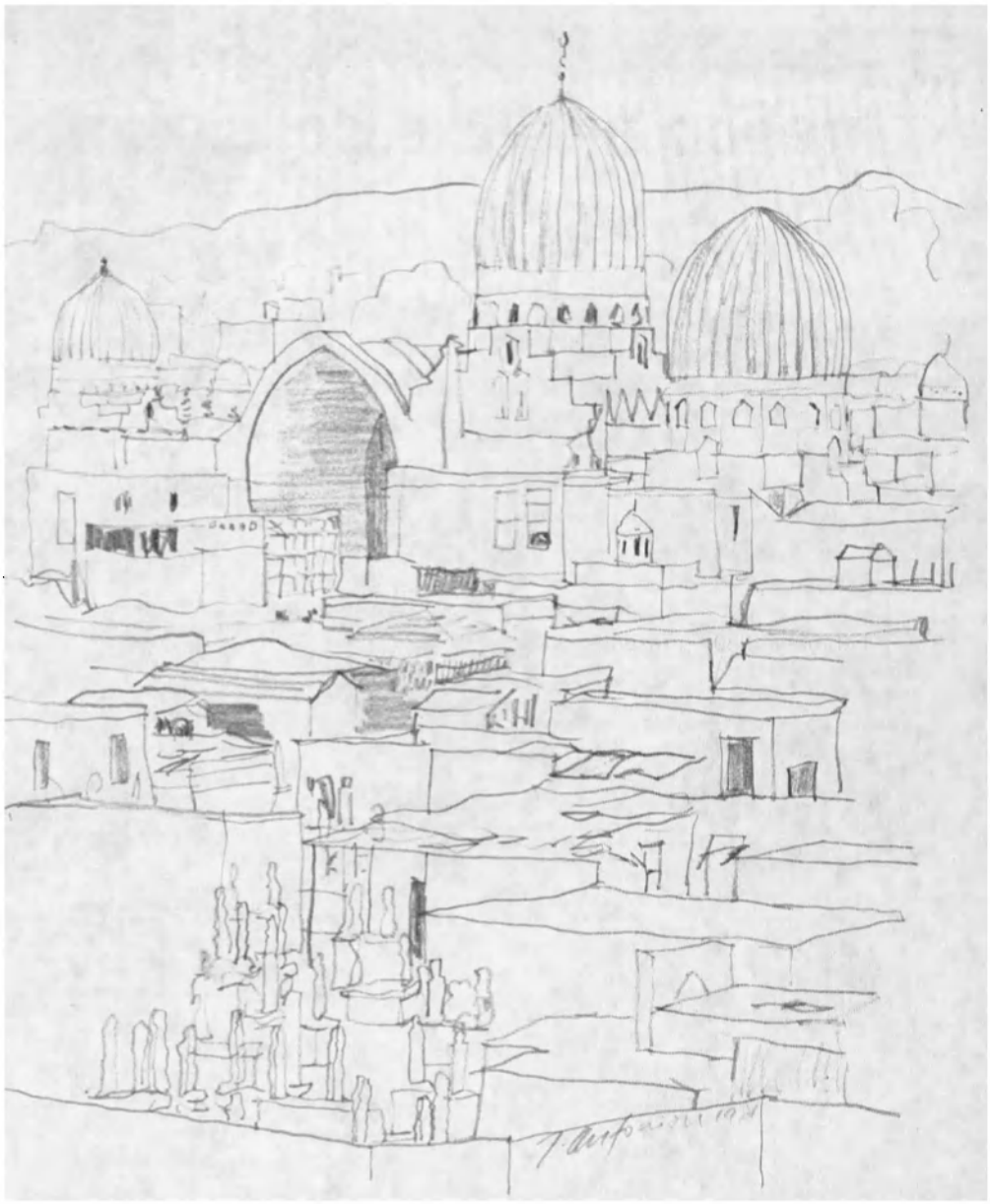
Nasr to the shrine of Hussein. The street is also a sub-centre for the adjacent housing districts which are accessible through the many lanes branching off from the spine.

*Zone Three,* centred on the Ghouriya, contains the buildings of the Mamluk Sultan al-Ghoury and a series of traditional *suqs* (markets). These originally extended from the Sharia Muski southwards as far as the Mu'ayyad complex (Zone Four) and were cut by the Sharia al-Azhar. To the east, close to the Sharia Hammam al-Masbaja is a vegetable market which acts as a local focus for the surrounding area. Further east, the al-Azhar Mosque, which is adjacent to this zone, is both a major tourist attraction and an important religious centre.

*Zone Four* is centred on Bab Zuweila, the southern gate of the Fatimid city, linking the walled city with its southern extensions. Immediately south of the gate, the spine features a unique sequence in the old city, from the small open space outside the gate to the covered Street of the Tent-Makers. Due to industrial activities nearby this zone suffers from the impact of heavy vehicular traffic and contains many dilapidated and abandoned plots. Yet it remains a vital centre of life for the southern part of the Fatimid city.

*Zone Five* stretches along the Sharia Ba al-Wazir, a section of the street running from Bab Zuweila to the citadel which is itself a ramification of the main north-south spine of Islamic Cairo. This street has kept much more of its traditional character and activities than the main spine south of Bab Zuweila. With several Mamluk mosques and mausoleums projecting diagonally into the street space and with some fine specimens of traditional housing structures surviving, the area offers an important potential for rehabilitation. This zone includes a number of modern housing blocks and a large irregular open space behind the Blue Mosque which is used as a youth centre. Traffic is less of a problem than in the other zones, although large buses operating on this spine often cause congestion.

*Zone Six* contains a fine sequence of Mamluk and Ottoman monuments on the road leading from the Ibn Tulun Mosque to the Citadel. The zone is crossed by the main north-south spine leading from Bab Zuweila to the cemetery of Saida Nafisa and offers possibilities of future extension. More than any other zone it has suffered from the impact of change and redevelopment, due to the fact that Saliba Road is today a major traffic artery. ■



***In 1982, as a follow-up to the mission described on this page, Unesco commissioned architect Jim Antoniou to "define the extent of conservation zones in the safeguarding plan for al-Fustat, Old Cairo, the Citadel and the North and South Cemeteries" (see map opposite page). As a result of population pressure and shortage of housing some 500,000 people live in the cemeteries in and around the tombs. The cemeteries contain many of the finest mausoleums and monuments in the Islamic world. Above, the North Cemetery which contains the tombs and mausoleums of the Burji Mamluks (1382-1517 AD/785-924 AH).***

***Bab Zuweila, the southern gate of the Fatimid city (Zone 4).***

Drawings © Jim Antoniou, London

*This text is based on* The Conservation of the Old City of Cairo, *the technical report on the Unesco mission to Cairo. The drawings illustrating the text are by Jim Antoniou, field director of the project and author of* Islamic Cities and Conservation, Unesco, 1982.

# The world's urban

**The problems and the future of the great metropolitan areas of the world were discussed by 800 participants at an international symposium, *Metropolis 84,* organized by the Regional Council of the Ile-de-France and held in Paris from 10 to 12 October 1984. The report on the proceedings of the symposium, on which this article is based, has been published in *Les Cahiers de la I.A.U.R.I.F. (Institut d'Aménagement et d'Urbanisme de la Région d'Ile de France), Paris (N° 74).* It covers the four main themes of the symposium: demography and town planning, economic and technological change, transport, and culture and environment.**

FROM 1900 to 1975, the number of cities with a million inhabitants increased tenfold and that of cities with over five million inhabitants multiplied by twenty. During the same period, the total population of the twenty-five largest cities more than quadrupled and will be multiplied eight to ten times by the year 2000. Their average size will pass from two to sixteen million inhabitants and they will include about six per cent of the world's population and twelve per cent of its urban population. In the year 2000 more than half of the twenty-five cities with more than ten million inhabitants and nearly half the cities with over four million inhabitants will be located in Asia.

The universalization of urbanism is a new fact. Before the year 2000, for the first time in the history of humanity, the world will have more town dwellers than country dwellers. If conurbations with over one million inhabitants are included, metropolitan areas will assemble sixty per cent of the urban population, or over 1,500 million individuals.

This change will be accompanied by a swing in the relative importance of metropolitan areas. Those in the industrialized countries are stagnating and regressing (London, for example, has lost two million people in forty years) and those in the Third World are rapidly expanding. In 1975 there were 262 million people in the metropolitan areas of the developed coun-

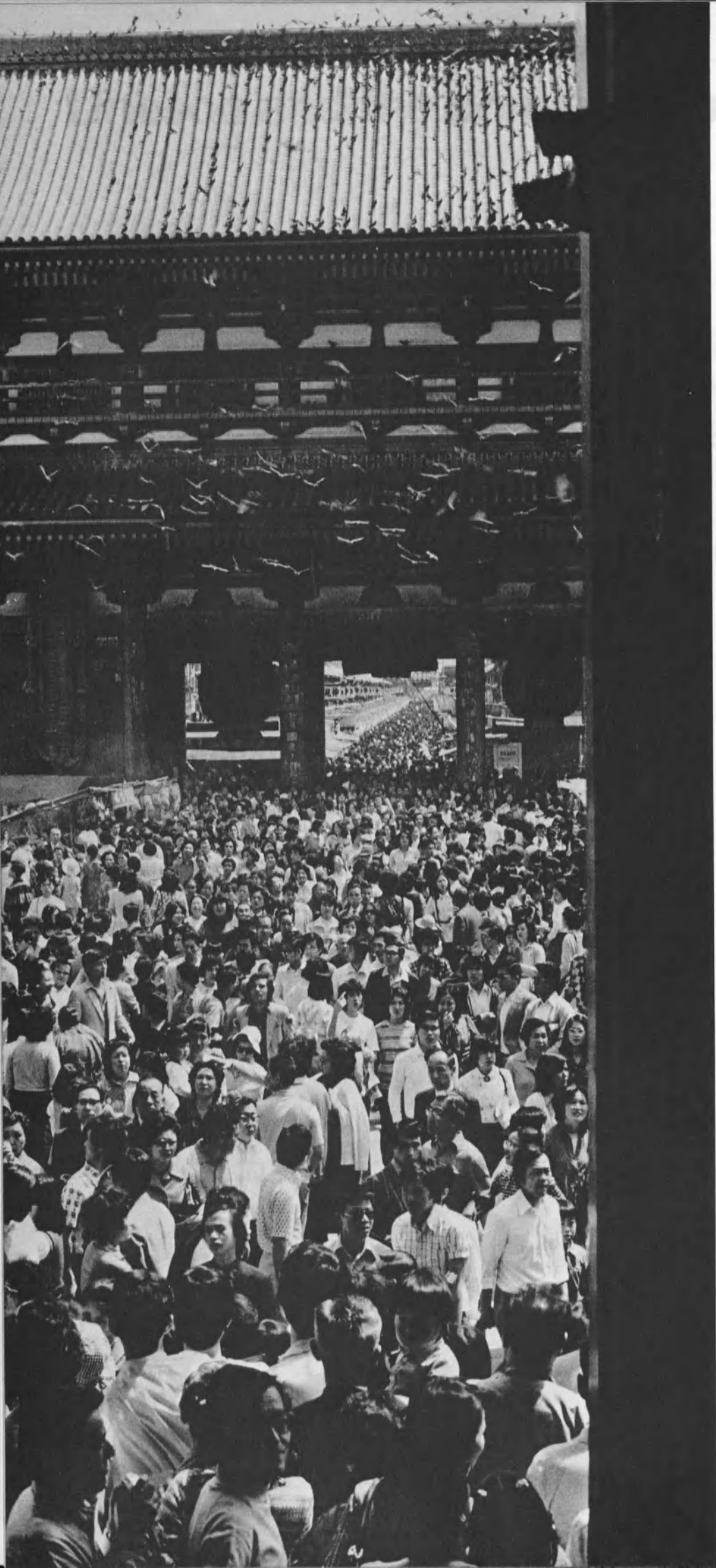


Photo © Yohei Higashira, Tokyo. UNFPA Photo Competition

***By the year 2000, for the first time in history, more people will be living in towns and cities than in rural areas. Most urban dwellers (over 1.5 thousand million persons) will be living in conurbations of over one million inhabitants. Demographic pressure on cities bursting at their seams is illustrated in this photo of a Tokyo crowd. In 1980 the 28.7 million inhabitants of the Tokyo Metropolitan Region represented one quarter of Japan's entire population.***

# explosion

tries as against 244 million in those of the Third World. In the year 2000 Third World metropolitan areas will have 914 million people, more than double the 444 million forecast for the industrialized countries.

This demographic and urban evolution is taking place in the context of an economic crisis and the imbalance in population distribution will be accompanied by an increasing gap in the distribution of wealth. All this will occur in a world brought closer together by improved transport facilities, the multiplication of commercial exchanges and the increasing openness of boundaries and cultures to the spread of information.

The increase in the mobility of mankind is inescapable—from one country to another, from one continent to another, under the attraction of the real or imagined opportunities offered by metropolitan areas beyond the barriers of the frontiers of today. California's powerful magnetic appeal to the people of Latin America is perhaps premonitory.

In the metropolitan areas of developed countries with low growth or falling populations, the problem today is one of reviving activity, preserving and highlighting the cultural heritage, preventing the depreciation of certain districts before they are transformed into ghettos, and making the best possible use of existing infrastructures.

The metropolitan areas of the developing countries, on the other hand, are seeking to control their demographic growth, to organize urban extensions, to make good their lack of facilities and services and to make productive use of the available labour force.

Those responsible for the metropolitan areas in developing countries are faced with problems of alarmingly rapid growth. The urban conurbations in these countries have average growth rates of between five per cent and seven per cent per annum which means that they double every fifteen years. Each year additions to their populations can be counted in hundreds of thousands (350,000 in Cairo, 300,000 in Bangkok, 750,000 in Mexico City) and the areas of agricultural land lost in thousands of hec- ▶

***Long a problem in countries that first used the automobile on a large scale, urban traffic congestion is now a growing cause for concern in many Third World cities as well. Monumental traffic jams occur regularly in such cities as Lagos, Bangkok and São Paulo (right). Handicapped by insufficient infrastructures to meet current needs, cities in the developing world are today facing massive and ever-mounting demands for public transport by low-income users.***

Photo Paolo Gasparini, Unesco

▶tares, often in the richest agricultural areas in the country.

The evidence is that this rapid growth is going to continue for several years. The rural population today is still very considerable. Its birth rate is greater than that in the cities and generates demographic growth far superior to that which agriculture can absorb (1.5 per cent per annum according to the experts). While, for cultural reasons, the birth rate is lower in the cities, the mortality rate there is lower still. As a result the normal growth of the urban population is more rapid than that of the rural population, as witness the examples of Mexico, India and China.

Faced with this problem a number of countries and metropolitan areas are doing their best to control metropolitan growth in a variety of ways: demographic policies and national encouragement to decrease the birth rate—China provides the most striking example, promotion of agricultural activities and development of related activities in small rural towns, development of medium-sized towns, etc. Nevertheless, it is generally agreed that metropolitan growth will remain, for several decades, at a level close to that being experienced today. Those responsible for metropolitan areas in the Third World will therefore have to make provision for the reception of these huge inflows of new inhabitants.

A variety of often complementary solutions have been adopted: the creation of development zones, new districts, new towns; the extension of infrastructural networks, prefabricated or do-it-yourself housing, etc. However, the speed at which such operations can be undertaken does not match the rapidity of population growth. In addition there is the problem of the poverty of the newcomers which is intensified by the current crisis. It is everywhere evident that economic development and therefore employment are not progressing fast enough to meet their needs. The difficulties of employment and poverty in the metropolitan areas of the Third World are reflected in the anxiety of the worker whose budget is whittled away by accommodation costs and the anguish of those who know that their accommodation is only temporary.

Employment is the number one challenge. Yet at the same time it offers a way towards a solution to all the problems described above, whether in the metropolitan areas or elsewhere.

In addition there is the high cost of urbanization in the large conurbations. In developing countries, national resources are limited. It is not easy to define an urban policy that allows satisfactory development of metropolitan areas without signing away the economic and social development of the country as a whole.

Throughout this century, the metropolitan areas of the developed countries have witnessed periods of rapid growth which those in charge have usually tried to halt by various methods. The situation today is very different and although some conurbations (such as Los Angeles, Moscow and Madrid) are still expanding, others appear to have stable (Ile-de-France; the Randstad—the urban circle in the Netherlands comprising Rotterdam, The Hague, Leiden, Haarlem, Amsterdam,

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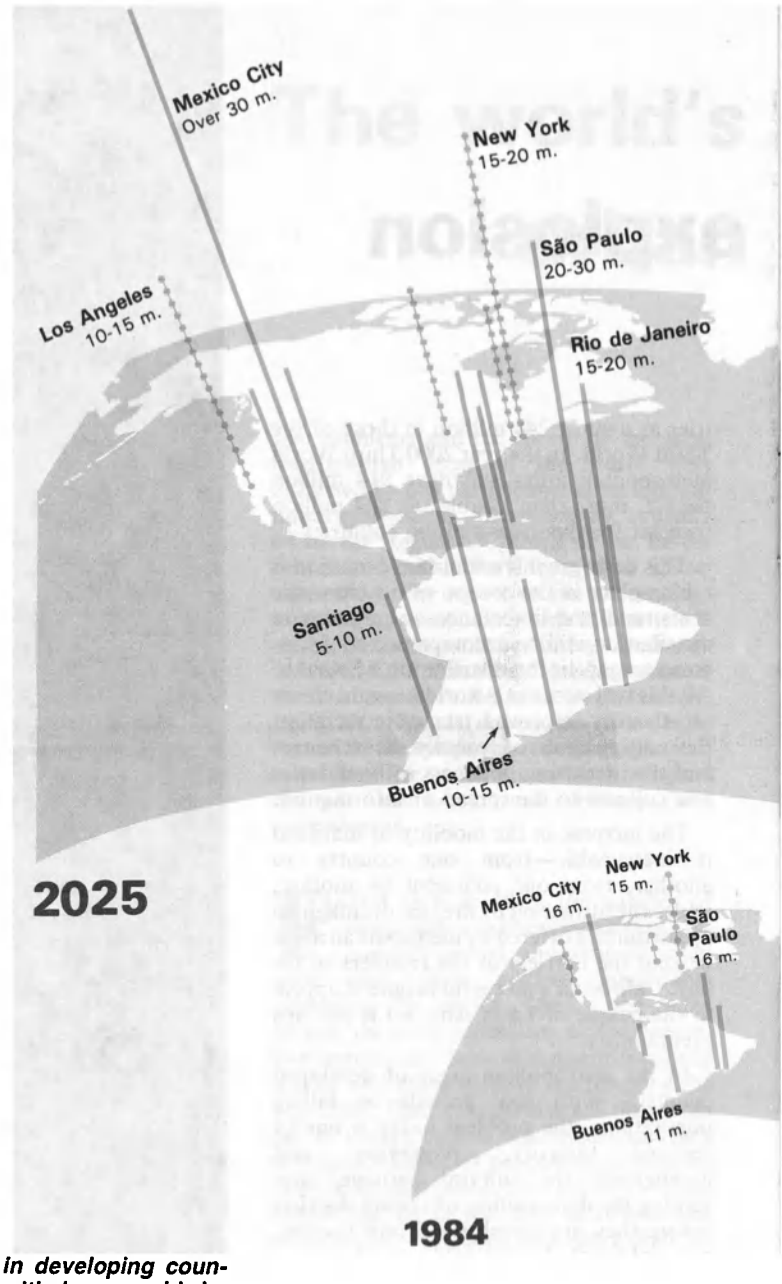



***Metropolitan areas in developing countries are confronted with demographic increases on a scale never before known. Below, modern housing in Abidjan, capital of Ivory Coast. The city's population, estimated at 2 million in 1982, is doubling every 7 years.***

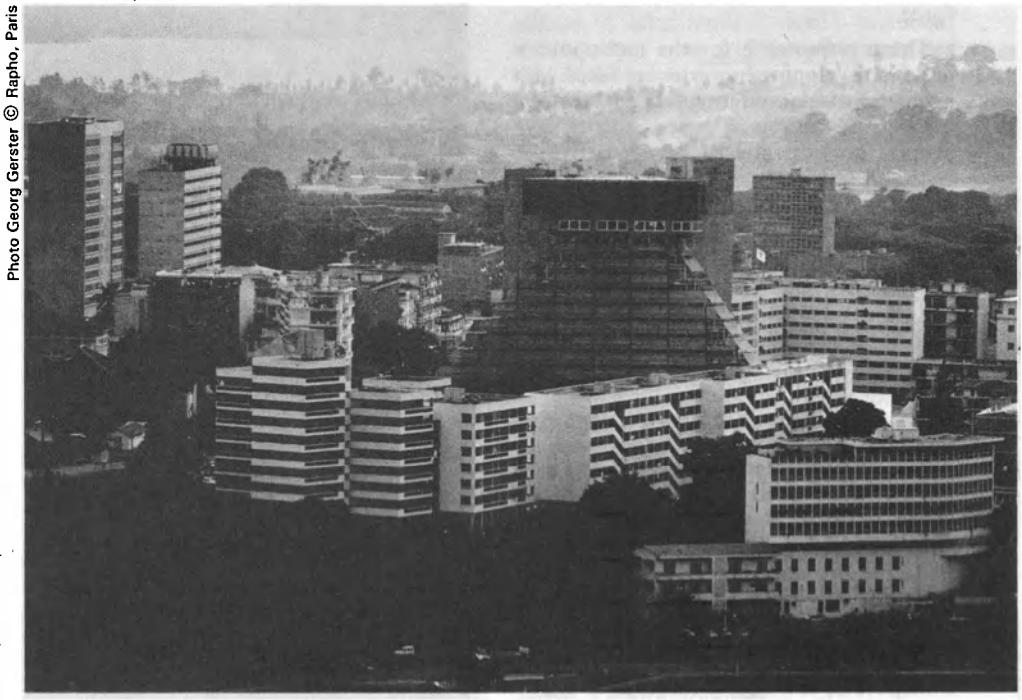


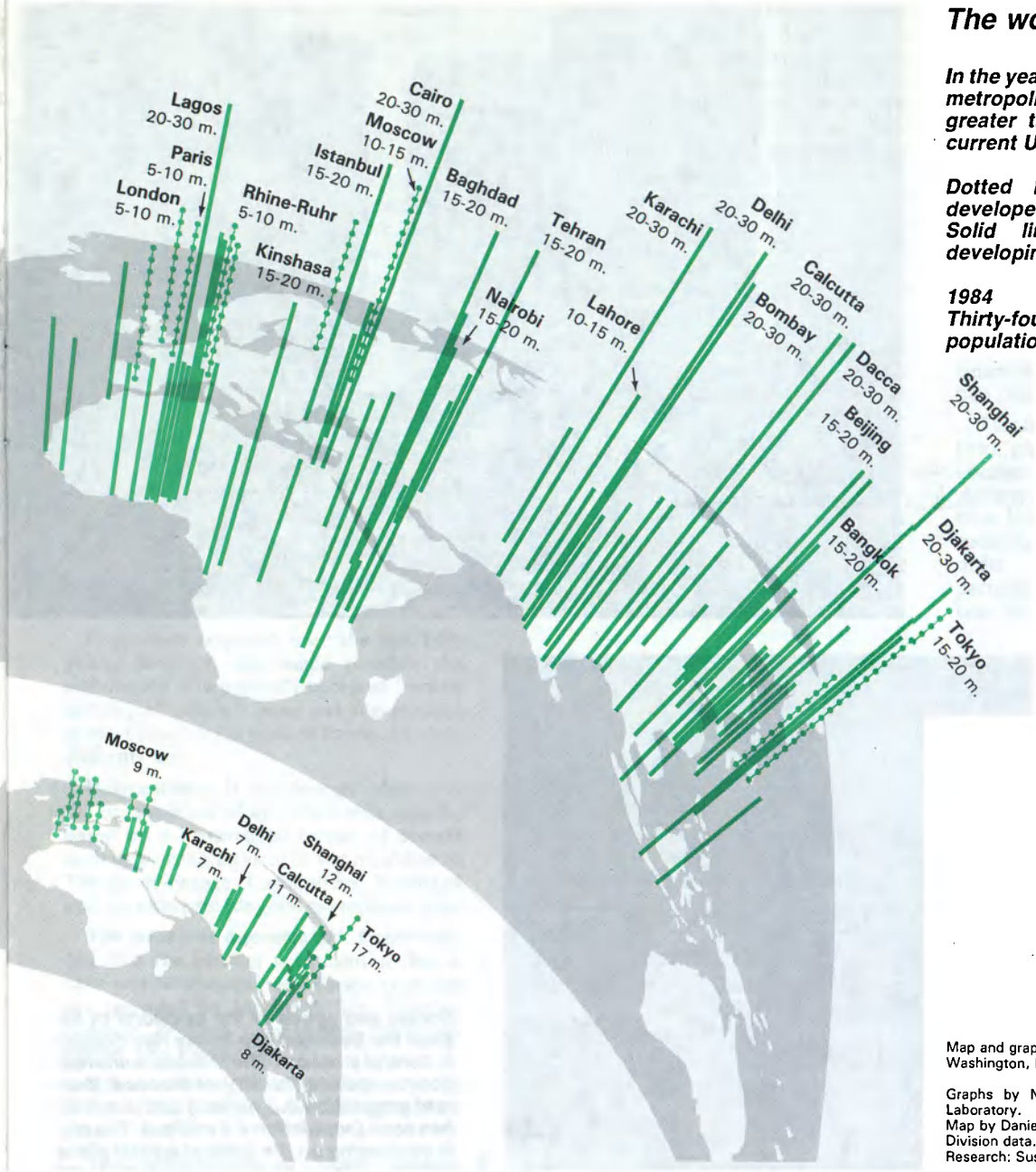
Photo Georg Gerster © Rapho, Paris

## The world's urban explosion

***In the year 2025 there will be ninety-three metropolitan areas with populations greater than five million, according to current United Nations projections.***

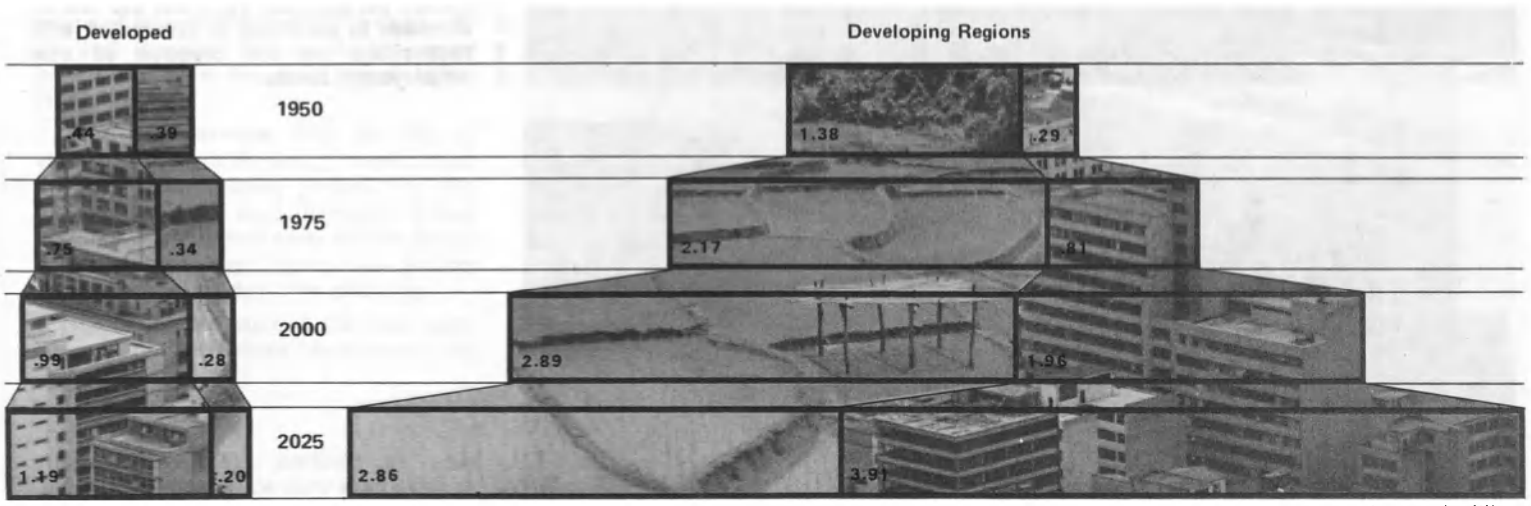
***Dotted lines: Metropolitan areas in developed regions***
***Solid lines: Metropolitan areas in developing regions***

***1984***
***Thirty-four metropolitan areas with populations greater than five million***




Map and graphs courtesy of *National Geographic* magazine, Washington, D.C.

Graphs by National Geographic Society Computer Map Laboratory.
Map by Daniela Collins, based on United Nations Population Division data.
Research: Susan B. Malcolm and Barbara W. McDonnell




Population in thousand millions

***Schematic presentation above shows demographic growth patterns in industrialized countries (on left) and in developing countries (on right). Blocks show the proportion of urban dwellers (in grey) to rural dwellers (in green). In the industrialized countries the percentage of urban dwellers has risen spectacularly but total population has nearly stabilized and will probably rise only slightly from 1.2 thousand million today to 1.4 thousand million in 2025. In Third World countries numbers will nearly double to 6.8 thousand million, largely in urban areas.***

*Mats and sacking provide scanty cover for these migrants squatting in front of high-rise flats in Bombay. Like many burgeoning Third World cities, Bombay is facing a critical shortage of housing combined with an old, insanitary stock: 84 per cent of dwellings have only one room and 52 per cent of them accommodate 6 persons or more. It has been estimated that even the cheapest social housing is only accessible to the wealthiest 40 per cent of the population. Every day, 500 new immigrants arrive in the city. At this rate, according to United Nations forecasts, over 17 million persons will be living in Greater Bombay by the year 2000.*

Photo © APN, Paris

*Domes and spires of the cathedral of St. Basil the Beatified rise above Red Square in central Moscow. The Moscow conurbation comprises the city of Moscow (current population 8.3 million) and a suburban zone (population 4.2 million). The city is developing on the basis of master plans drawn up for a period of from 20 to 25 years. Population growth averages 90,000 persons per year, but the rate of increase is declining in connexion with restrictions on the creation of new employment zones.*

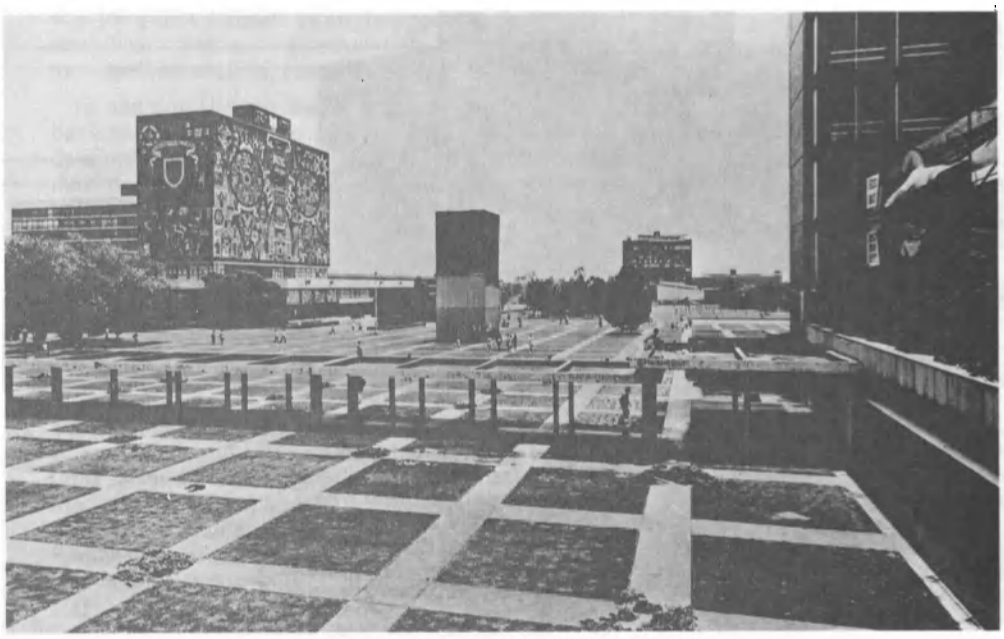


Photo Paolo Gasparini, Unesco

*Decentralization and the promotion of greater social participation in city management are among the major challenges facing the world's great metropolitan areas today. Left, view of the National Autonomous University of Mexico in Mexico City which is currently growing at the staggering rate of 750,000 persons each year.*

CONTINUED FROM PAGE 26

Hilversum, and Utrecht) or decreasing (London, New York, Brussels) population figures. The desired limitation has been achieved, yet there remains a certain dissatisfaction.

This stems from the fact that, even when the populations of the conurbations are no longer increasing or are even decreasing, the space occupied continues to grow up to the very limit of what is acceptable in the economic context of today, particularly with respect to networks and facilities.

At the same time, due to the effect of the economic crisis, qualitative problems are multiplying: socio-professional changes connected with developments taking place in industry, increasing impoverishment of large sectors of the metropolitan population and the development of social problems, delinquency, drug addiction, and criminality. The increase in the number of the impoverished is a sign of the poor health of society as a whole. In the towns these vulnerable population groups are concentrated in particular areas, emphasizing the social stratification.

Experience acquired over the last fifty years, however, has made possible the elaboration of a generally accepted "urban technique" which is being put into practice in most countries in various forms. Its main elements are:

**Polycentrism.** It has become clear that the organization of an urban area must be based on a hierarchical system of centres each dispensing services to the inhabitants. The Ile-de-France, Los Angeles, Randstad and London provide good examples of this;

**The notion of discontinuity.** Green belts can halt the blanket urbanization that is now everywhere rejected. Varied examples are provided by Montreal, Los Angeles, Moscow, Brussels, Copenhagen, the Ile-de-France and Randstad;

**Urban renewal.** This appears to be an essential factor in improved integration of inhabitants;

**The optimization of town planning operations.** The scale of these operations has been considerably reduced, allowing forms of intervention to become more subtle and therefore better adapted, more human and better integrated into the urban framework;

**Energy conservation.** After the crisis of the 1970s concern for energy conservation modified town planning perspectives. Too much dispersion is costly in energy. Linear development, overspill areas and the grouping of services have become the guiding themes of present-day town planning.

Experience has exposed the great complexity of metropolitan phenomena. The large metropolis is neither a static organism nor an isolated fortress. It is involved in multiple exchanges with the surrounding regions. Even when it is experiencing a net loss of inhabitants it continues to receive newcomers in their tens, hundreds or thousands. Intensive and permanent exchanges take place in its midst: while population is diminishing in some parts of a conurbation—often the city centre—in other parts it is increasing. This is why urban extension and the replanning of city centres are often problems which must be tackled simultaneously.

Are common solutions appropriate given the diversity of the situations? The demographic, social, economic and cultural differences between the continents are obvious. Moreover, each concrete situation is the product of a particular geographical and historical setting and therefore unique.

Everywhere the metropolitan area is emerging as the most suitable level for reflection and action. Even though the outlines of the metropolitan area remain unclear and changing, and it has to work in collaboration with local, regional, federal and national communities, the urban region must clearly be considered as a whole.

The technical, cultural and financial feasibility of different urban policies is a key factor. Experience throughout the world shows that what makes the difference between success and failure is not the town planning or aesthetic aspects of the projects, that is to say their intrinsic qualities, but their appropriateness to the local technical, administrative and financial context. Immense progress remains to be made in this area and is all the more necessary in view of the economic crisis and the weak financial situation of the Third World urban populations.

This is why the participation of citizens in town planning choices is being widely advocated. The fast pace of growth, the cultural diversity, the size of the populations in question, the complexity of the procedures, are all obstacles to be overcome in order to ensure a genuine citizen participation—and the best chance of success for future projects. ■

Photo George Rodger © Magnum, Paris

Photo Mark Edwards © Earthscan, London

***After experiencing periods of rapid growth earlier this century many conurbations in the industrialized countries today appear to have stable or falling population figures. London, right, is one major city which is experiencing demographic decline. Greater London has lost some two million people in 40 years (8.6 million in 1939, 6.7 million in 1981). Forecasts indicate that this depopulation will continue but at a more moderate rate.***

# The outlook for urban man

MAN is increasingly becoming an urban species. Whereas in 1960 about a third of the world's population lived in towns and cities, by the turn of the century it is expected that around half will do so. Cities are also increasing in size. In 1950 there were only six urban agglomerations with more than 5 million inhabitants; today there are 26, and by the end of the century there could be as many as 60—all but 12 of them in developing countries. It is in the cities that the problems of population growth are magnified to frightening proportions: the urban population of the Third World is expanding at a rate of 3.6 per cent a year, almost twice as fast as the population in general, and some cities are growing three or four times as fast, a few at over 10 per cent a year.

For Third World countries, the implications are enormous in terms of providing adequate common services and ensuring food and employment for at least double the number of people currently residing in urban areas. Many cities are already familiar with the problem (although few would claim to be coping adequately): São Paulo, for instance, is already adding half a million inhabitants every year. An extreme example of the scale of the problem is the estimate that to bring in the extra water needed for Mexico City by the year 2000 will require electricity consumption equal to the total present-day electricity consumption of the city's buildings. Problems are compounded by the fact that between one-third and two-thirds of most Third World city dwellers live in squatter settlements with inadequate water supply and other amenities.

Often, programmes intended to improve conditions in different urban sectors are planned and carried out independently, sometimes cancelling out each other's benefits. For instance, efforts to expand industry and create employment may reduce water or energy for domestic purposes.

Those concerned with modern city planning thus have to grapple with problems of considerable complexity. Urbanization needs increasingly to be seen in the context of overall development plans and investment strategies, as Recommendation 39 for the further implementation of the World Population Plan of Action adopted in Bucharest in 1974 suggests, "with the aim of achieving... a reduction in current high migration to capital cities and other large urban centres, the development of medium-sized towns and a reduction of rural-urban and regional inequalities".

A better understanding of the urbanization process is one of the aims of Unesco's programme in this field. At a recent meeting of experts, a common programme was agreed for identifying sources of vulnerability within urban systems as they evolve, and various means outlined of increasing the resilience of systems and their adaptability to change.

Many Unesco studies on migration have a bearing on urbanization and help to throw light on the motivations for movement from the countryside and to the city, the choice of migrant destination, and on adjustment and failure to adjust to the host society.

Bearing in mind one of the key recommendations of the Plan of Action—that population distribution policies should be integrated with economic and social policies—Unesco has increasingly linked its migration research to the broader perspectives of national development. Its main aim is to investigate the variations in migratory patterns and their causes, as well as the consequences for the areas of origin and destination. It studies the interactions between rural and urban environments and their implications for population growth and change in different areas. Migration has complex consequences for the lives and welfare of the migrants and their families, as well as for their home and host communities. Recent Unesco country studies cover a wide range in time and space: migration into Mexico City from 1930-1970, three centuries of internal migration in France, internal migration in India, and the growth of medium-sized towns in Nigeria.

Unesco research on the dynamics of migration has highlighted the complexities of both "push" and "pull" factors in the movement of workers and their families. The density of settlement on the land, carrying capacity stress, the degree of commercialization, the forms of land tenure and labour use, the farming technology in use, the reform of land tenure arrangements, and the degree of provision of social and economic services to the countryside—all impinge directly on the process of rural out-migration. These factors may assume even more importance in the future as population growth in marginal farming areas contributes, in a vicious circle, to further environmental degradation.

The central idea emerging from Unesco's work in this field is that migration policies should be formulated within the context of general development plans, and that these policies and plans should aim to remove rural-urban inequalities, create more small towns to act as a counter-attraction to the cities and a focus of rural development, and to introduce strong welfare components and the provision of basic services into rural development programmes.

In many countries, internal migration is a crucial element in achieving and maintaining a balance in the various productive sectors of the economy, and as such is a major element in the development process. If allowed to occur in a policy vacuum, however, migration can have severe consequences and impose a strain on the provision of basic services. Governments should recognize this and make appropriate plans and policies. Unesco studies indicate that well thought-out incentive structures and policy interventions at the source region have a higher probability of success than either migration controls or policy actions at the destination region alone. Migration controls, as Recommendation 38 for the further implementation of the World Population Plan of Action notes, "are difficult to enforce and may infringe on human rights".

Unesco research has also drawn attention to the fact that most Third World planning has failed to take account of the complexity of the relationship between "pull" towns and cities and the surrounding rural areas. As they grow, towns come to depend on ever more distant regions for their supplies of water, energy, food and building materials, and the extra demand created often leads to the degradation of both neighbouring and more distant land through overexploitation. Another area for intervention is the almost total lack of knowledge and understanding of the causes and consequences of migration on the part of the public and of local and regional leaders both in rural and urban areas. This area of migration information and communication is one which Unesco is paying increasing attention to.

Although rural-rural migration is more widespread and more important than was thought only a few years ago—for instance in India it is now known that around 70 per cent of all migratory movements are of this type—it is the widespread drift to the towns and cities of the Third World which creates most concern among governments.

Unesco has also drawn attention to the need for population involvement in improving urban settlements, since the solutions to many development problems can often be found within the society, and much work can be carried out by the people themselves with little external support. One way of achieving this goal is through the use of "barefoot architects", who, after simplified training, would be able to solve many of the major problems of shanty towns or villages. He or she would be able to deal with the basic problems of roadways, water supply, drainage, house construction and the building of community buildings such as schools. Such a person, drawn from the community itself, would be able to mobilize community support and guide local people in the use of simple technologies to enhance the use of locally available resources. ■

*This text has been extracted from* Unesco, Population and Development, *a study prepared by Unesco for the International Conference on Population held in Mexico City from 6 to 13 August 1984.*

Photo © Jacques Evrard, 1981, Brussels

# A back-to-the-earth approach to housing

*by Jean Dethier*

A realistic picture of the new trends in architecture and housing techniques that are destined to prevail at the end of this century would be incomplete without reference to a domain in which rapid and important developments are already taking place—building which uses unbaked earth as its prime material.

Earth building as an architectural technique, which in its up-dated form has an important role to play in meeting the needs and challenges of our time, has a very long history. Since towns were first created, some ten thousand years ago, men have used this material to build entire cities—palaces and temples, churches and mosques, warehouses and forts, defensive walls and proud monuments.

Readily available over most of the globe, this seemingly humble material has been used in every continent and climate, in all latitudes and in nearly every pre-industrial culture and civilization, in long stretches of the Great Wall of China, built over twenty centuries ago, as well as in both the simplest and the most imposing dwellings. It has proved its versatility and the extraordinary variety of forms and functions to which it can be applied. Its solidity and strength, when it is correctly used, have been abundantly demonstrated.

Over recent years Unesco has helped to promote recognition of this part of the universal heritage by proposing the classification of towns with fine examples of buildings in unbaked earth such as Ouro Prêto, in Brazil, Shibam, in the People's Democratic Republic of Yemen, and Sanaa, in the Yemen Arab Republic.

Since the beginnings of modern science attempts have been made to rationalize and improve the empirical earth-building techniques used in pre-industrial societies all over the world.

The pioneer in the use of these techniques in modern times was the French architect François Cointeraux (1740-1830). As early as 1797 he invented several processes for stabilizing earth to increase its mechanical and chemical resistance and its adaptability to the new creative trends in architecture which had been launched by such visionary architects as Claude Nicolas Ledoux (1736-1806) and Etienne Louis Boulée (1728-1799).

Cointeraux was not only a theoretician, he was also a practitioner and an enlightened teacher and published many works which were widely read not only in Europe but also in the Americas and Australia. For the best part of a century his designs were used in the construction of factories, schools and public buildings as well as of dwellings of all kinds, ranging from stately homes and middle-class residences to housing estates for workers and five-storey city apartment blocks.

Cointeraux can thus be considered to have invented modern earth architecture two centuries ago. In the Grenoble and Lyons areas of France, where Cointeraux lived, several specimens of his creative talent survive in perfect condition, adding their contribution to the age-old traditional urban and rural architectural heritage of buildings made of earth. So this region is a kind of vast open-air museum of the oldest ▶

***Unbaked earth dwellings at Shibam in the Wadi Hadramaout valley, People's Democratic Republic of Yemen. Built around the 4th century AD, the town is one of the most remarkable examples of Yemeni art and architecture. Its constructions of unbaked earth date from between the 16th and the 20th century. In December 1984 the Director-General of Unesco launched two appeals for international solidarity, one for the safeguard of Shibam (which has been on Unesco's World Heritage List since 1982) and Wadi Hadramaout, and the second on behalf of Sanaa, the historic city which is capital of the Yemen Arab Republic.***

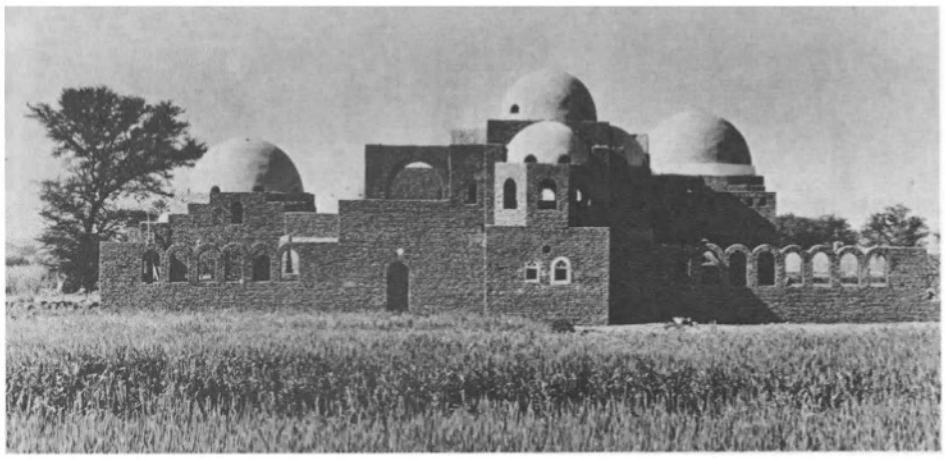


Photo © Christine Bastin, Brussels

*This vast modern building of unbaked earth was built near Luxor, Egypt, in 1980 by the French architect Olivier Sednaoui.*

▶ and the most modern earth-building techniques.

But in France, as elsewhere, the irresistible commercial progress of industrial materials such as cement, concrete, baked bricks and steel has led to a gradual decline in the use of earth during the present century. It was only when violent crises interrupted the production of these materials that architects and builders again had recourse to unbaked earth. This happened in Europe during and after both world wars. Tens of thousands of earth dwellings were built, especially in Germany, during the 1920s and again in the 1940s. Also during the 1940s some of the great stars of modern architecture—Frank Lloyd Wright (1867-1959) in the United States and Le Corbusier (1887-1965) in France—designed a number of projects in unbaked earth.

During the same period this new architectural approach had its first repercussions outside the industrialized countries. A very rational and impressive regional hospital was erected in 1943 at Adrar, Algeria, by the Belgian architect Michel Luyckx. In Egypt, Hassan Fathy was to set out on a long cultural odyssey lasting forty years which would lead him to rediscover the age-old earth building traditions of his country and to rehabilitate and modernize them. His approach, at one and the same time theoretical and practical, philosophical and militant, was to make him the first *guru* of a democratic form of architecture that was specifically adapted to the cultural and economic realities of a Third World country.

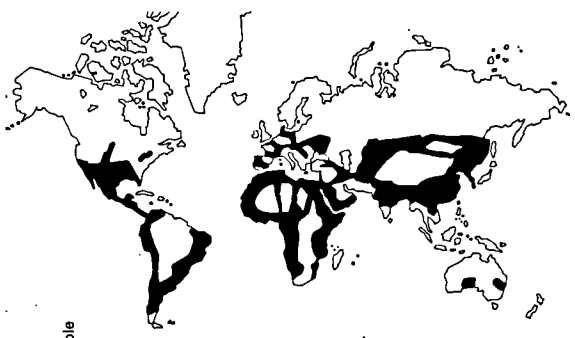
However, despite the important work accomplished by these and many other architects all over the world, during the 1950s and 1960s earth building continued to be marginal and precarious as compared with the predominant modes of thought and production. The advocates of "progress at any price" were strong in numbers at that time of economic euphoria in the West and of political euphoria in a number of Third World countries then coming to independence. From the very start the mere idea of using earth as an officially approved building material was scorned and rejected.

This was the golden age of the "international style" in architecture, of unbridled industrialization and "heavy" technology which so many countries adopted as their chief or sole model for economic, technical and cultural development.

For many reasons decision-makers and planners have now become more realistic and have adopted a more diversified approach. Various development myths have given way to doubts followed by a search for less grandiose, less "universal" solutions that are better adapted to local realities. The concepts of "appropriate technology" (appropriate to a specific context) and "intermediate technology" (intermediate between the costly heavy technology of the industrialized countries and archaic, outmoded traditional techniques) have come into their own.

Since 1972 international energy and economic crises have imposed an urgent reappraisal of modes of thought and action, not only in the rich but also in the poorer countries. Substitute energy-saving solutions were suddenly needed in the building sector—a big energy consumer in all countries. It was then discovered that the customary building materials, such as cement, concrete, steel and even baked bricks, were, by their very nature, high energy consumers.

By the early 1970s a small international group of architects and engineers had already foreseen this inevitable development. They started discreetly to elaborate alternative solutions and set up a non-profit association within the Grenoble School of Architecture—the *Craterre* group. Its aim is threefold: first, to study the whole range of earth building techniques scientifically and without any pre-judgement, to modernize them and make them operational, reliable and economical in the light of present and future requirements; second, to participate directly in earth building schemes, both in Europe and in the Third World, so as to provide a practical demonstration of new approaches to housing and public works problems; finally, on the basis of this



Map © "Craterre", 1984, Grenoble

*Map showing the main world regions where there is a tradition of using unbaked earth as a building material. All told, 1.5 thousand million persons (30 per cent of the world's population) live in dwellings made of unbaked earth. Half the population of the developing countries is housed in dwellings of this kind: most of the rural population and at least 20 per cent of town- and city-dwellers.*

## Adobe and rammed earth

***A score of traditional techniques of building with unbaked earth exist in different parts of the world. The two leading methods are based on the use of the* adobe *brick (a word of Arabic or Berber origin assimilated into Spanish and transmitted to the Americas where it is also used in English) and the wall of* pisé de terre *("rammed earth", a French expression which first appeared in Lyons in 1562 and has since found its way into many other languages).***

***The traditional adobe brick is hand moulded in a wooden frame in which a mixture of earth, water and chopped straw is piled and then dried in the sun. Today adobes are made by using a mixture of earth, water and a fixative (e.g. 2 or 3 per cent of cement). The mix is then strongly compacted in mechanical presses which produce more rapidly adobes that are far more robust than the hand-made kind.***

***Traditional* pisé *is made by compacting earth mixed with water and chopped straw in mobile wooden forms set up on each side of the wall which is being built, to a minimum width of 40 cm. This technique has also been modernized by introducing a small amount of fixative into the mix instead of straw and by using a pneumatic rammer instead of manual compaction using a pestle.***

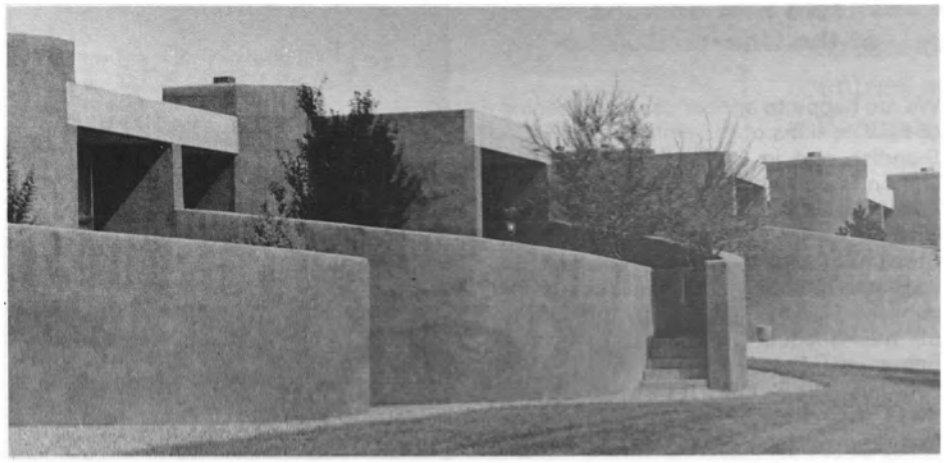
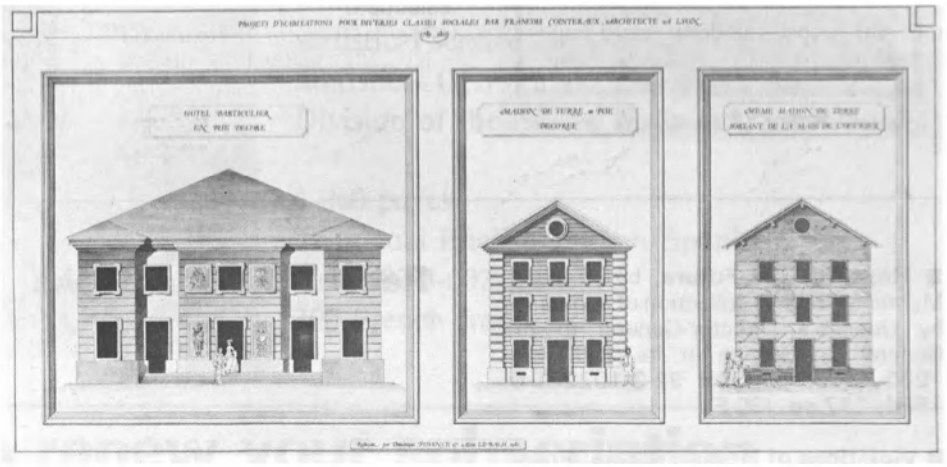


Photo © Jacques Evrard, 1981, Brussels

***Architecture using unbaked earth has taken on a new lease of life in the United States. The "La Luz" housing complex in the suburbs of Albuquerque, New Mexico, comprises a hundred ultra-modern luxury dwellings. It was completed in 1975. The walls of earth-plastered adobe bricks are girdled at the top by a concrete armature which extends to form a flat roof. This project by the American architect Antoine Predock has already been inscribed on the United States National Register of Historic Places.***



Drawings © Alain Lebahle and Dominique Pidance, 1981, Paris

***The French architect François Cointeraux (1740-1830) was the first man to modernize unbaked earth construction techniques and waged a lifelong struggle on behalf of this form of architecture. He designed urban and rural housing as well as buildings for agricultural and industrial use. Above, three types of dwelling built in 19th-century France "for diverse social classes" from plans by Cointeraux.***

balance between research and its applications, to fill a serious void in the field of training by setting up specialized courses at university level.

In the early 1970s, thanks to this threefold approach, the Grenoble School of Architecture became the only one in the world to provide this type of training, which was open to architects and engineers from all countries. A setting was thus created for study and practical work on the future of economical building techniques at a time of very rapid growth in demand for ultra-cheap urban and rural housing in the Third World (the needs of urban Africa alone within the coming fifteen years are estimated at fifty million housing units) and of worsening economic crisis in many of these countries due to their enormous foreign debts.

Under these circumstances, recourse to earth makes it possible to avoid importing costly materials or the energy to produce them locally. The earth option enables a form of development to be envisaged that is centred on the indigenous economic, natural, cultural and human resources of the country or region concerned. Thanks to appropriate transfers of modern earth building technology it is possible to move directly from outmoded techniques to the most efficient processes, the houses being constructed, if so desired, by the future occupants themselves.

There has been a radical change in recent years in the attitude, both of the public and of decision-makers, towards the use of this material previously regarded with prejudice if not hostility. This change has been confirmed by the international success of exhibitions such as *Earth Architecture: the future of an age-old tradition* (organized in Paris in 1981 by the *Centre de Création Industrielle)* and the construction of a unique experimental housing centre in the new town of l'Isle d'Abeau, at Villefontaine, near Lyons, France.

The interest aroused by the latter achievement has led many experts and technicians from other parts of Europe as well as from Asia, Africa and the Americas to come to l'Isle d'Abeau to study on site the possibility of adapting the techniques used there to the needs of their respective countries. In November 1984, Unesco, in collaboration with the *Craterre* group, organized a one-week, on-site seminar for a group of architects and decision-makers from six countries in Africa and the Middle East who are faced with the need to build a large number of schools at very low cost for which this technology could be adapted.

Encouraged by the success of this initial experiment in earth-built dwellings and the international interest it has aroused, the authors of the project are already planning a second, more ambitious and structured project in France to meet the growing demand in this field.

An *International Earth Building Institute* is to be established this year with *Craterre* as its nucleus and in association with a number of scientific, technical, university and cultural partners. Its activities will be concentrated in four sectors of major importance: research, practical applications, university-level education and information. This strategy corresponds exactly to the forms of action requested as an "urgent priority" at the *First International Symposium on Earth Construction,* held at Brussels in December 1984 under the auspices of the United Nations.

It is hoped that a second complex will be built in earth at l'Isle d'Abeau to house the future Institute, the complex being completed by an Earth University, an Earth Embassy, a Museum of Earth Building Techniques, an hotel and a number of individual and collective dwellings. By its nature this complex would provide an opportunity to make use of an extensive range of architectural, urban, technical and functional variations using earth as the building material.

This project should be completed by the summer of 1987, the date set by *Plan Construction*—an experimental and research body attached to the French ministry for housing and town-planning—for an important international symposium in this region to be organized in collaboration with the Institute. One of the objectives of the symposium, provisionally entitled *Le Sommet de la Terre,* will be to review the real political, economic, social, technical and cultural issues involved in the use of earth-building methods in different parts of the world.

Meanwhile, in 1985, China will play host in Beijing to another international seminar which will review the results of recent research in which that country, like so many others, is closely interested.

These reviews and perspectives will form a vital, realistic contribution to the *International Year for Housing and the Homeless* which has been proclaimed by the United Nations for 1987. ■

**JEAN DETHIER,** *Belgian architect and town-planner, is architectural consultant and organizer of architectural exhibitions at the* Centre Georges Pompidou, *Paris. He has a special interest in the promotion and spread of information about the techniques of earth architecture, a subject in which he has become an internationally recognized expert. He is the author of* Earth Architecture: the Future of an Age-old Tradition *and organized an exhibition of the same name which was held in Paris in 1981.*

## Two new editions of the Unesco Courier

We are happy to announce the launching of new editions of the *Unesco Courier* in Swedish and in Basque. The Swedish edition is published, under the auspices of the Swedish National Commission for Unesco, by Nordan publishers, Stockholm. The first issue appeared in January 1985. The Basque edition is published by the Department of Culture of the Basque Government, in San Sebastian. The first issue appeared in February 1985. With the publication of these two new editions, the *Unesco Courier* now appears in 31 language editions, not counting the quarterly Braille selection.

## Recent Unesco books

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■ **Copyright Laws and Treaties of the World.** Supplement No. 23, 1981-1983. The 23rd supplement in the collection of the copyright laws and treaties of the world covers multilateral conventions as well as laws adopted by individual countries. The work has been regularly updated since it first appeared in 1956. Compiled by Unesco and the World Intellectual Property Organization (WIPO) with the co-operation of the Copyright Office of the USA and the Industrial Property and Copyright Department, Department of Trade and Industry of the UK. Co-published with the Bureau of National Affairs Inc., Washington, D.C., which has exclusive sales rights in the USA and Canada. ISBN 92-3-101946-5. 1984 (1,400 F).

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PHOTOCOMPOSITION CHRISTIAN PAGNOUD - 6/8, rue des Ebinettes - 75017 PARIS - PHOTOGRAVURE DAWANT - 13, rue des Arquebusiers - 75003 PARIS.

**Editorial, Sales and Distribution Offices:**
Unesco, 7, Place de Fontenoy, 75700 Paris
**Subscription rates**
1 year: 68 French francs. 2 years (valid only in France): 120 French francs. Binder for a year's issues: 52 FF

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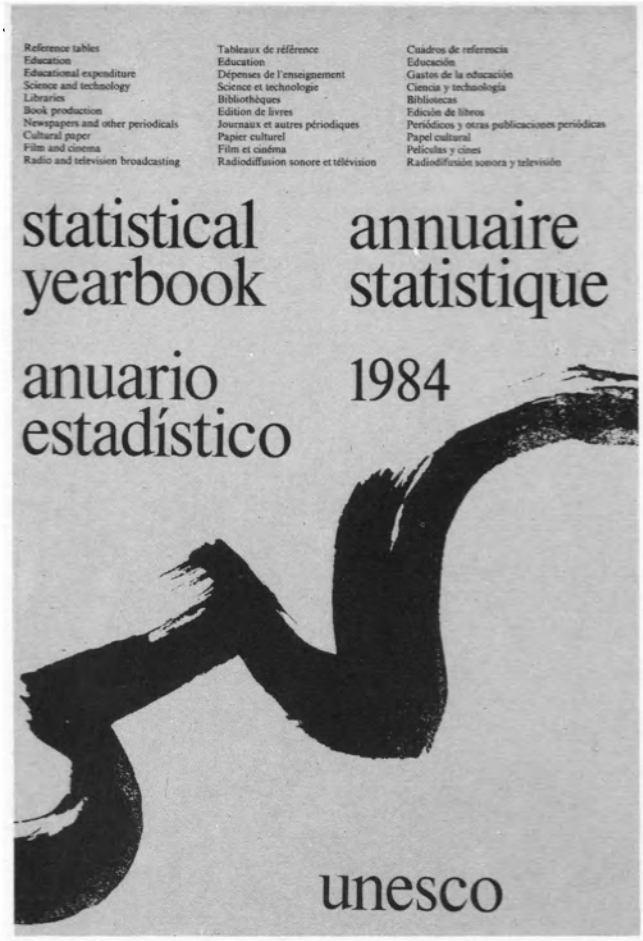


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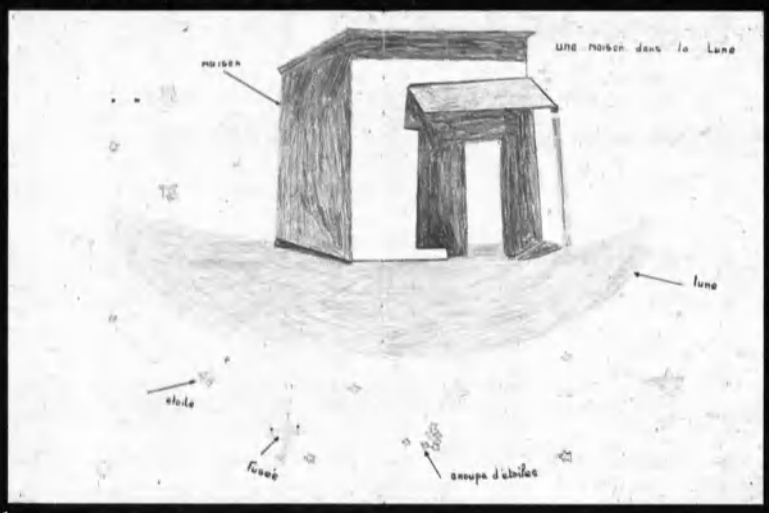
# *'My life in the year 2000'*

**This was the theme of an international children's art contest organized by Unesco, UNICEF and the United Nations High Commissioner's Office for Refugees on the occasion of the International Year of the Child in 1979. Pictures selected from over 600,000 entries submitted by children from almost 100 countries featured in an exhibition which was shown in Paris, Montreal, New York and Geneva, before touring Unesco Member States. The seven pictures on this page were all selected for the exhibition; number two was one of ten works awarded the first prize.**



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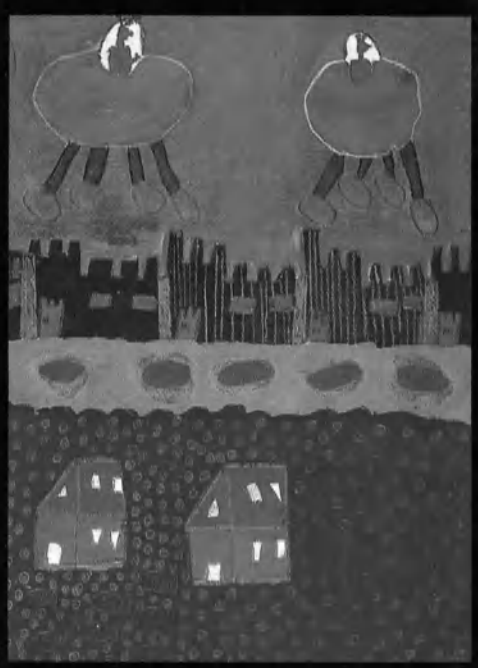
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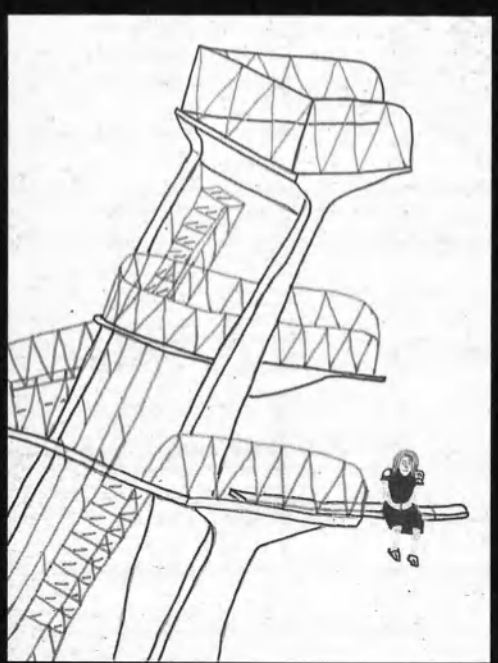
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1. Nare Ismaïla, aged 11, Burkina-Faso (formerly Upper Volta).
2. Claudia Chesi, aged 9, Austria.
3. Maria Martha, aged 12, Argentina.
4. Rose Micallef, aged 10, Malta.
5. Kazi Zinat Hoque, aged 6, Bangladesh.
6. Katarzyna Zielenda, aged 8, Poland.
7. Rima Salam, aged 11, Lebanon.

6

7

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